

# iNELS Air

Sensors and detectors for IoT



# ELKO EP, Holding

The company ELKO EP has been one of the leading European players in the field of residential and industrial electrical devices for more than 25 years. Since 2007, the company has been developing and producing its own system of Smart Home & Building Solutions called iNELS.

At present, ELKO EP employs nearly 240 people, exports to 70 countries around the world and already has 16 foreign branches. The company is justly proud to produce its own components, and to have its own development and innovation of new products. It is also able to offer its customers instantaneous distribution and rapid, flawless service. The company became the Company of the Year in 2012 and earned its place as one of the TOP 100 Czech companies.



# Facts and Stats



**16**  
BRANCHES  
OVER THE WORLD

**70**  
EXPORTING  
COUNTRIES

**240**  
EMPLOYEES

**5 000**  
INELS INSTALLATION

**12 000 000**  
MANUFACTURED PRODUCTS



# About iNELS Air

**iNELS Air was designed in response to the dynamically developing network for IoT (Internet of Things). The IOT wireless communications category describes the Low Power Wide Area (LPWA). This technology is designed to provide full coverage even inside buildings, with energy-saving and low-cost operation of individual devices.**

The product group includes sensors for communication on the Sigfox, LoRa and NB-IoT protocol. Linking sensors with ELKO Cloud and IFTTT (If This Then That) is ideal for a wide range of applications.

Individual products have the letter “S”, “L” or “Nb” in their type designation. This distinguishes the way of communication. “S” stands for communication over the Sigfox network, “L” stands for communication over the LoRa network, and “Nb” uses communication via the NarrowBand network.

Smoke detector and Air quality sensor



Monitoring of energy



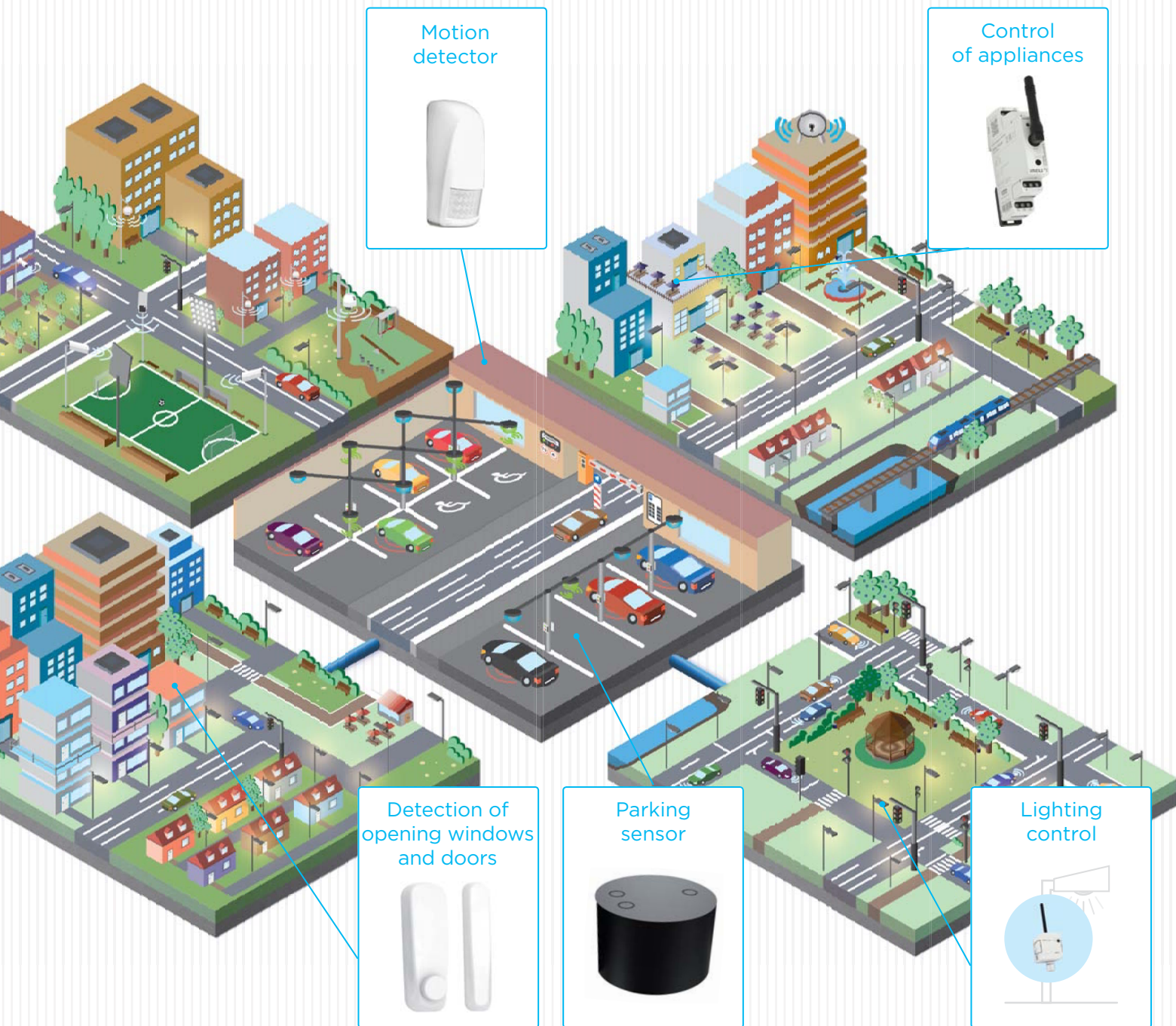
The network supports bidirectional communication with a limited number of feedbacks. It uses the free frequency band of 868 MHz. It has more extensive coverage across the Czech Republic and abroad and is therefore more suitable for long distance monitoring of the equipment. You can find current network coverage on the site [www.sigfox.com](http://www.sigfox.com).



A bidirectional network using the free band of 868 MHz for its communications. The advantage of this network is the possibility of freely deploying the individual stations in local locations, thus strengthening their signal. It can therefore be used effectively in areas of companies or cities, for example. You can find current network coverage on the site [www.lora-alliance.org](http://www.lora-alliance.org).

## NB-IoT

The network is the only one that uses the LTE licensed band for its two-way communication. The advantage of NB-IoT is the use of the already built-in network to ensure adequate coverage both inside and outside buildings. It uses this technology with its SIM card devices. You can find current network coverage on the site [www.vodafone.cz](http://www.vodafone.cz).



## \$ Saving

The use of web-based networks ensures low energy consumption. Thanks to this, most of the sensors can be battery-powered and their capacity can last for an average of 2-5 years. The sensors are simple and affordable. The price for ongoing communication varies depending on the type of network you choose - but in general this communication is considered affordable.

## 🔒 Safety

All data from the sensors is encrypted before sending, which ensures their security. Access to the individual measured data can then be done in the application or ELKO Cloud under your login information. This ensures the continuous supervision of your property.

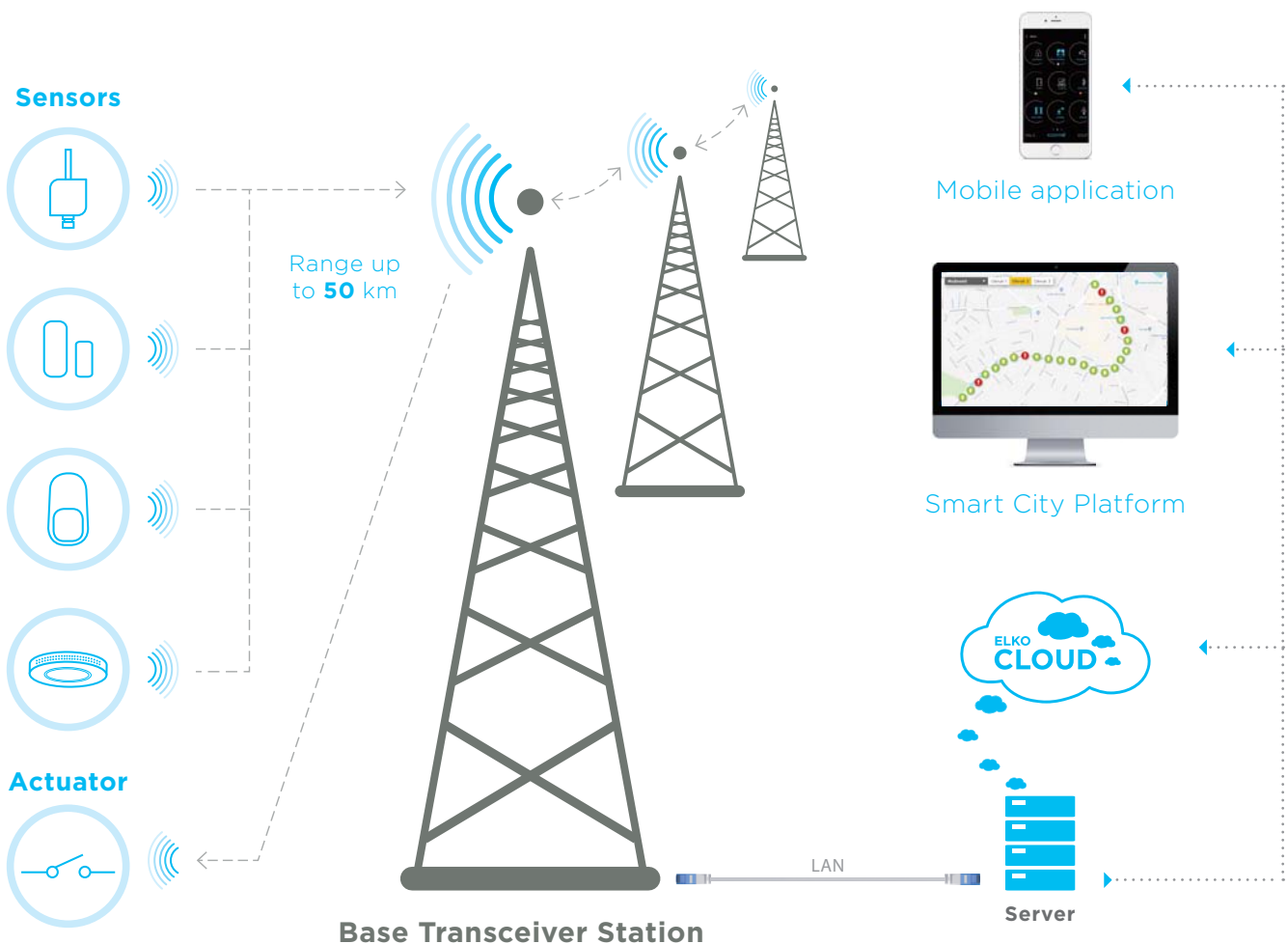
## 💎 Design

The design of the individual products is tailored to their purpose - the design of the detectors is designed for placing into interior spaces, the modular devices into the switchgear and, on the other hand, the products for outdoor use are IP65 compliant. The wireless design of individual devices also enables easy installation and almost immediate use.

# Principle function

**Data from sensors and actors (further as an „devices“) is sent via transmitters (BTS station) to the control server, from where they are sent to ELKO Cloud. Data transmission is provided by the UNB (Ultra Narrow Band) or LoRaWAN (Low Power Wide Area Network) internet protocol. Depending on the user's requirements, data may be sent to the smartphone application or integrated into the master system.**

Installation of individual sensors and detectors is very simple. You will place unit randomly in range of the network. The activation of the sensor is achieved using a QR code, which is placed on each component. For the operation of individual products, it is necessary to have a secure connection with the network provider you want to use. This connectivity allows you to select individual intervals for sending messages according to your requirements.



# User registration

**To use the iNELS Air devices, you need to have an ELKO Cloud registration or app registration that will collect the current data from these products, store the history and back up your settings. An unlimited number of devices can be assigned to one account.**

The possibility of using ELKO Cloud: Cloud for customers of our company. ELKO Cloud is a bridge for smart phone control. User registration can be done at [www.elkoep.cloud](http://www.elkoep.cloud) or easily from iNELS Air. An email contact is always required to set up your account, this will serve as your login name and your account will be authenticated, and your password can be selected.

ELKO Cloud is secured with the SSL protocol.



User registration in ELKO Cloud

 [www.elkoep.cloud](http://www.elkoep.cloud)



Registration a device in mobile application

Available for:



## Registering a device

**Devices can be activated from iNELS Air, which is free to download on Google Play or the App Store. The first time you run the application, you can set up individual devices using the “Application Wizard”, which takes you through the entire required settings. When restarting the application, additional sensors and actors can be added in the same way in the Setup Menu.**

Each device has a unique identifier that it registers. These IDs (ID and PAC) are also used to activate connectivity from individual network operators for the Internet of Things, and they are loaded into the application using the QR code that is located on the item itself.

# Display modes

**Data from iNELS Air device can be displayed in several variants and combined with each other.**

An important carrier of all information and the overall history of each device is the ELKO Cloud. From this storage, all statement can then be displayed in your smartphone application, where you can set notifications in the form of a popup window in the top bar of the phone, by message to your email. Using this application offers one of the fastest ways to find out about the current status of your sensors and actors. Linking the device(s) to the ELKO Cloud and IFTTT Interface offers extra countless amounts of information on unwanted situations or alarms.



## ELKO Cloud

To easily view your data on your computer/laptop, use the ELKO Cloud, which in addition to current statuses also stores the history of your sensor data.

[www.elkoep.cloud](http://www.elkoep.cloud)



## Application

Simply check the current status of your connected power sensors or detectors directly in your smartphone. The application offers a user-friendly and intuitive environment.

**iNELS Air**



## Notification

The application alerts you to any unwanted status with a popup notification in the top bar of your smartphone. Quickly, you will learn about any changes without having to control the devices directly in the application.



You can view your iNELS Air data in several ways:



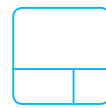
ELKO Cloud



Application & notification



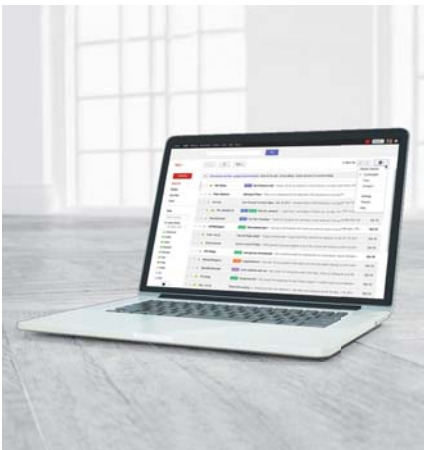
E-mail



IFTTT



Smart City Platform



## E-mail

You can also be informed about important changes to the monitored devices by receiving a notification email message direct to your e-mail address. For each sensor, e-mail messages can be set separately.



## IFTTT

IFTTT is a Cloud Bridge that allows iNELS Air communicates through social networks (Facebook, Instagram, Pinterest, and more). It can also control other compatible products within the app.



## Smart City Platform

The platform is designed specifically for displaying the status of individual sensors and actuators and at the same time control the switching devices in the Smart City. Using a laptop or computer, you can view the city plan and individual installed items to show you their current status - for example, free parking spaces.

# Measuring and monitoring temperature

**Monitoring the required temperature and not exceeding the set limits is a major problem for many industrial, manufacturing and warehousing process.**

The universal sensor can monitor undesirable heating or cooling fluctuations, which are immediately reported. It informs at regular intervals about the actual temperature in the monitored areas. The simple solution is to ensure continuous supervision, thereby eliminating any financial loss caused by overheating or subcooling of the premises or devices.

With its IP65 cover along with battery power makes it ideal for placement in less accessible places.

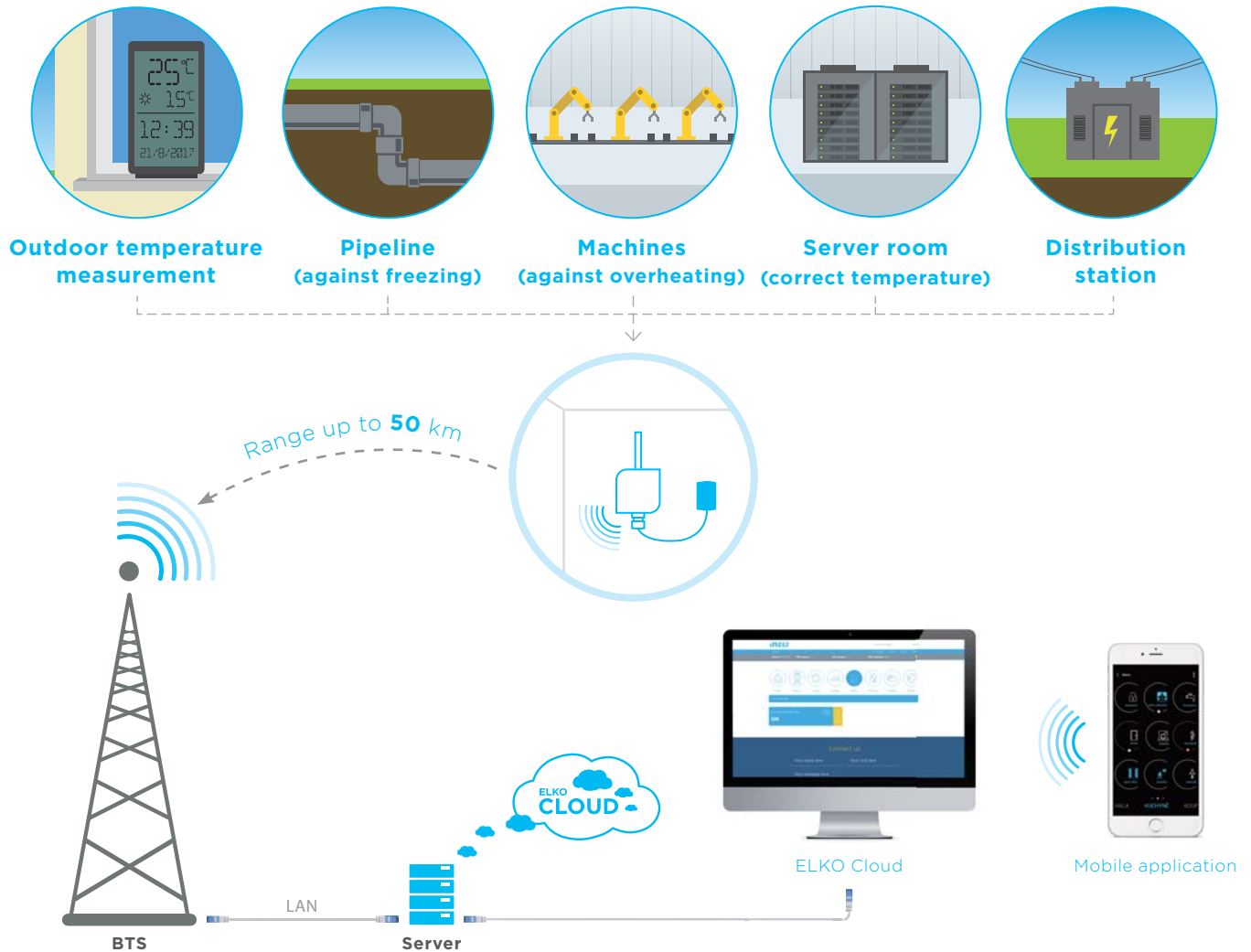


## Universal sensor

AirIM-100S, AirIM-100L, AirIM-100Nb

- measures the current temperature of your device through temp. sensors (see page 36)
- timely warnings against critical temperatures
- can be used for other measurements (voltage, current, level, energy, etc.)
- communications are provided by Sigfox (AirIM-100S), LoRa (AirIM-100L) and NB-IoT (AirIM-100Nb) networks
- only one sensor can be connected to the AirIM
- battery power/permanent power supply 5 - 12 V DC
- in IP65 enclosure (Protection against water, dust, ...)

## Examples of use:



### Technical parameters - Universal sensor

#### Power supply

Battery power:	1x 3,6 V battery SAFT LS 14500
Battery life:	approx. 5 years (according to the frequency of use)
External power supply:	5-12 V DC (On the clamp)
Supply voltage tolerances:	+10%, -15%
Quiet consumption:	0,2 mW
Transmitting power consumption:	150 mW

#### Settings

Settings:	Using setting pins
Alarm detection:	Use ELKO Cloud or Smartphone application
View battery status:	In Smartphone or ELKO Cloud

#### Indications

- Red LED:	broadcast
- Green LED:	pulse / indication of reception

#### Controlling

Controlling:	Button (communication test), magnetic contact, Tamper
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#### Connection

Sensor connection:	terminal block, wires 0.5 - 1 mm <sup>2</sup>
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#### Analog inputs

Thermal	TC / TZ*
Voltage	AIN 0(1) - 10 V
Current	AIN 0(4) - 20 mA
Battery measurement	12 V/24 V
Flood	flood probe*

#### Digital input

Input:	IN1, IN2 In Counter Energy measurement
Supported sensors for energy measurement* (For more information see p. 32)	LS (LED sensor) MS, WS (magnetic sensor) IRS (IR sensor) S0 (contact, open collector)

#### Output

Protocol:	Sigfox, RCZ1 (AirlM-100S)	LoRa (AirlM-100L)	NB-IoT (AirlM-100Nb)
Range in free space:	coverage 50 km	coverage 10 km	coverage 50 km

#### Other data

Working temperature:	-30 ... +60 °C **
Storage temperature:	-30 ... +70 °C
Operating position:	any
Protection:	IP65
Grommet:	M16 x 1,5 for cable ø max. 10 mm
Dimension (without antenna):	182 x 62 x 34 mm (96 x 62 x 34 mm)

\* Not included in the package.

\*\* Pay attention to the operating temperature of batteries -65 ... +80 °C.

# State and device monitoring

**The functionality of the equipment and machines is a priority for each manufacturer or operator. Detecting emergencies, critical states and monitoring the current state of the voltage or current of the connected devices can be ensured in a simple way. The universal sensor ensures smooth and seamless operation in the residential and industrial sectors.**

The sensors include analogue and digital inputs that are sent by a BTS transmitter to the ELKO Cloud, where the data is further redirected to the application on your smart phone. The devices can monitor a value of 0/1, measured at the input voltage of 0 (1) - 10 V or current 0 (4) - 20 mA or connect the output of the monitoring relays (see. Modular electronic devices, link can be found on page 36).



## Universal Modul

AirIM-100S/M, AirIM-100L/M

- in conjunction with the relevant monitoring relay monitors the current status of the appliances and detects critical and emergency states
- communications are provided by Sigfox (AirIM-100S/M) and LoRa (AirIM-100L/M) networks
- permanent power supply 24 - 240 V AC
- 1-MODUL, DIN rail mounting

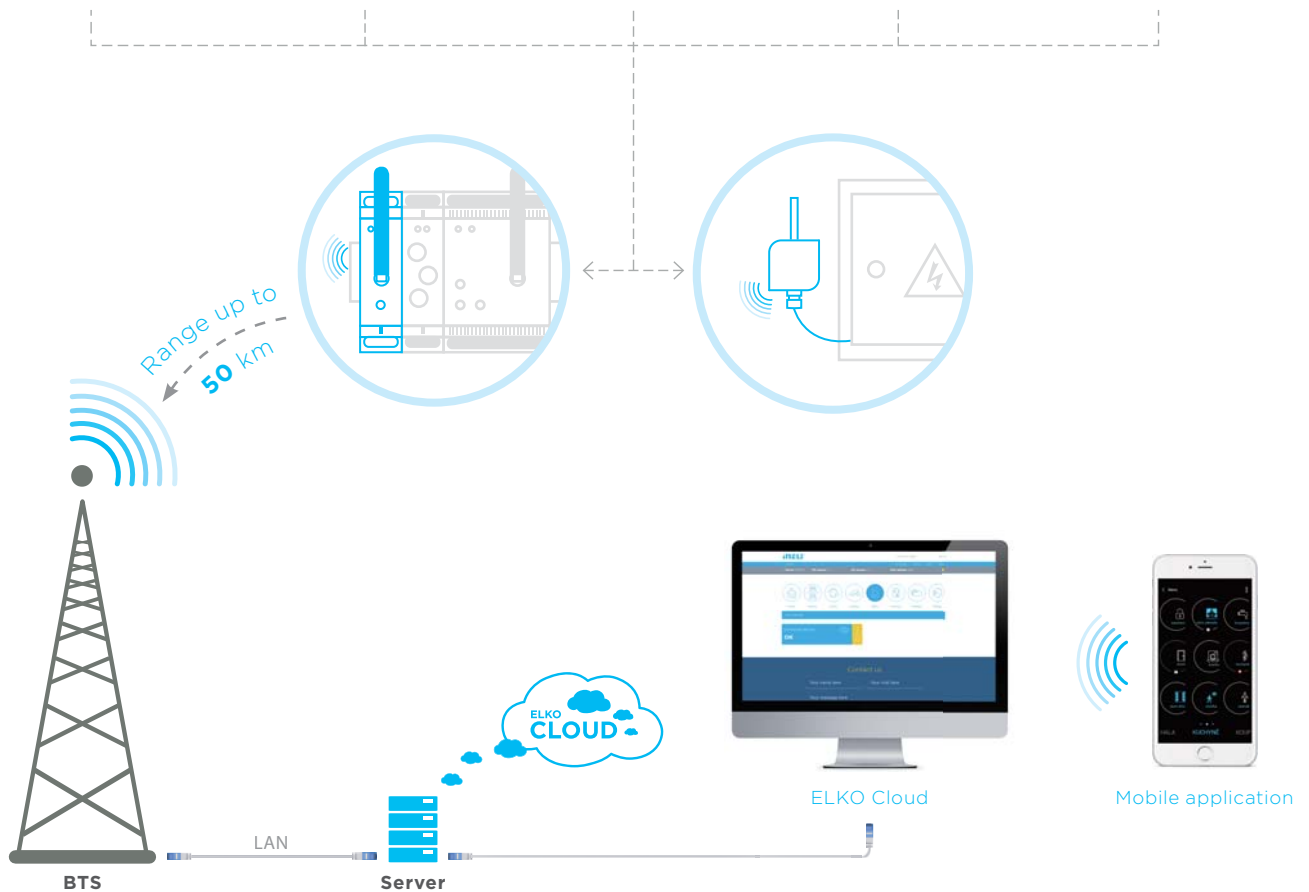
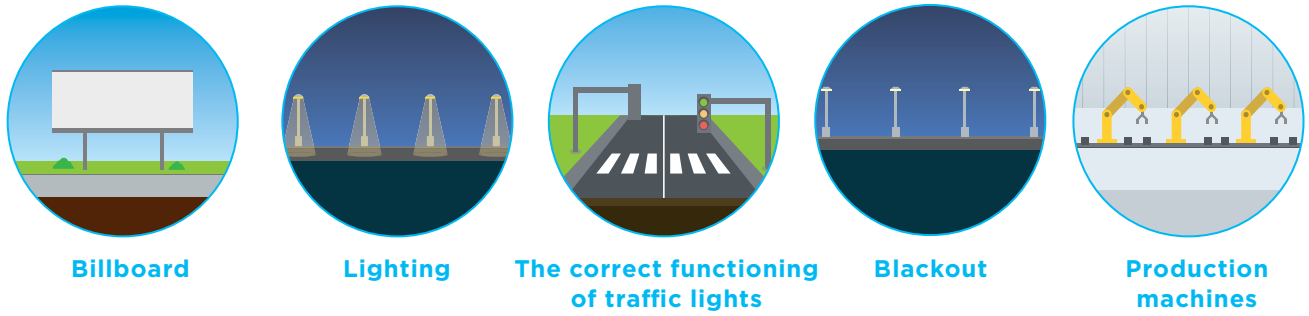


## Universal Sensor

AirIM-100S, AirIM-100L, AirIM-100Nb

- monitor current state of voltage or current flow
- timely warns when the set voltage / current is exceeded / falls below
- can also be used for other measurements (temperature, altitude, energy measurements, etc.)
- communications are provided by Sigfox (AirIM-100S), LoRa (AirIM-100L) and NB-IoT (AirIM-100Nb) networks
- battery power/permanent power supply 5 - 12 V DC
- in IP65 enclosure (Protection against water, dust, ...)
- technical parameters see Page 11

## Examples of use:



### Technical parameters - Universal modul

Power supply		Range in open space:	coverage 50 km	coverage 10 km
Supply voltage:	24-240 V AC / 50-60 Hz	<b>Input</b>		
Backup power:	battery Li-Ion			
Supply voltage tolerance:	+10 % / -25 %	Digital input:	IN1, IN2 In Clounter energy measurement flood probe	
Power consumption:	3 VA	<b>Other data</b>		
<b>Settings</b>		Working temperature:	-20 ... +50 °C	
Settings:	Using a ELKO Cloud Message	Working position:	any	
Alarm detection:	Use ELKO Cloud or Smartphone application	Mounting:	DIN rail EN 60715	
View battery status:	In Smartphone or ELKO Cloud	Protection:	IP20 from front panel	
<b>Indication</b>		Overvoltage category:	III.	
- Red LED:	broadcast	Contamination degree:	2	
- Green LED:	power supply	Output for antenna:	SMA connector*	
Controlling:	Button (communication test)	Cross-section of connecting wires (mm <sup>2</sup> ):	max. 1x 2.5, max. 2x 1.5 / with a hollow max. 1x 2.5	
<b>Connection</b>		Dimension:	90 x 17.6 x 64 mm	
Sensor connection:	terminal block, wires 0.5 - 1 mm <sup>2</sup>	<i>* Max Tightening Torque for antenna connector is 0.56 Nm.</i>		
<b>Communication</b>				
Protocol:	Sigfox, RCZ1 (AirIM-100S/M)      LoRa (AirIM-100L/M)			

# Protection against flooding, level control

**Flooding a room is one of the most common domestic accidents that you can easily avoid.**

The wireless flood detector monitors for any leakage from your washing machine or dishwasher and warns you in timely fashion of any unwanted water leakage in the bathroom, kitchen, or cellar. If water is detected, you will be alerted by notifications on your smart phone or the ELKO Cloud Report.

A universal float sensor or FP-1 external flood probe can be used to monitor the level and give early warning of critical values. Using a flood probe, it is possible to detect, for example, filling the sump while the float sensor reports the filling of the water or other liquid reservoir.



## Flood detector

AirSF-100S, AirSF-100L

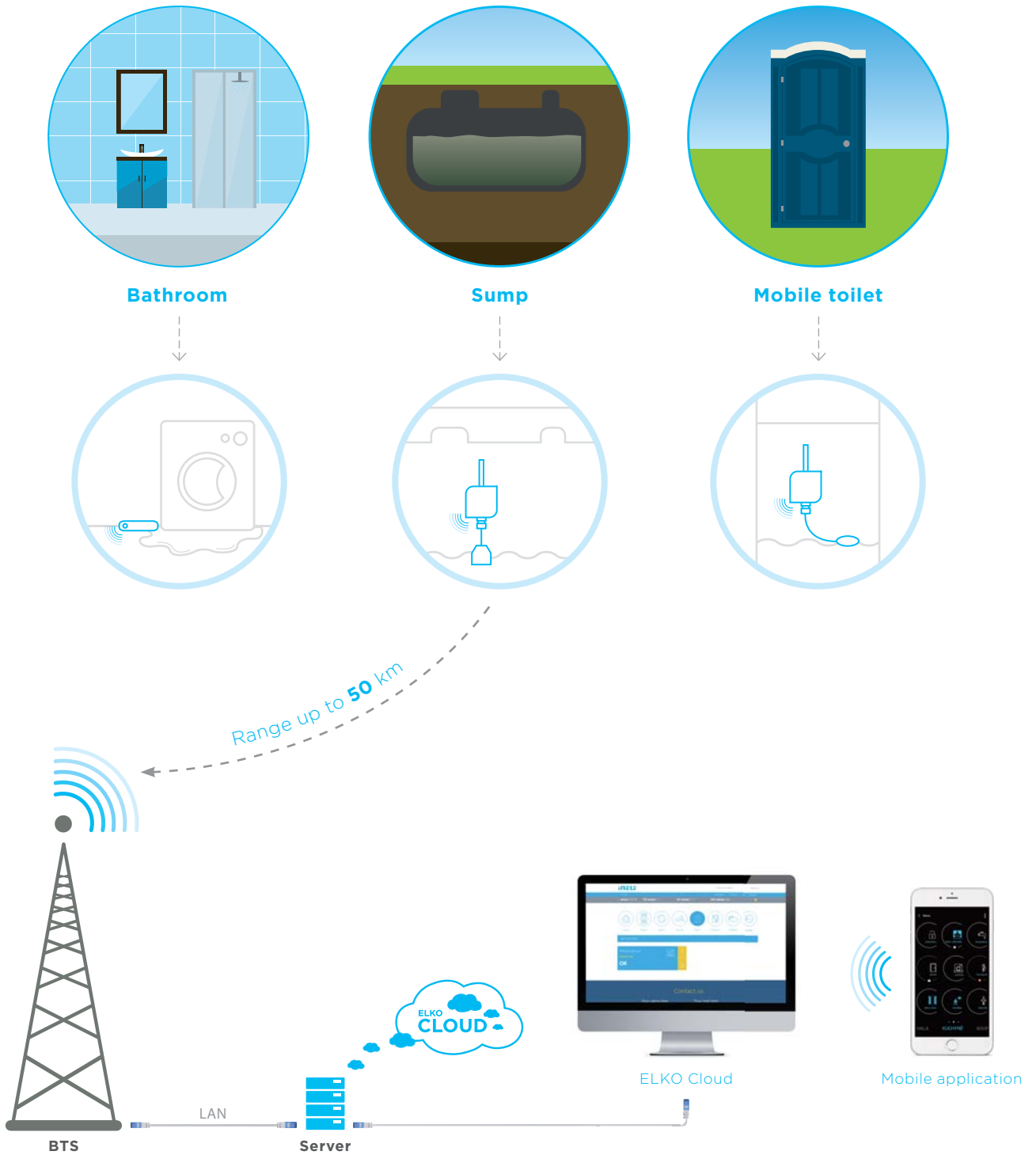
- activation occurs after flooding the bottom contacts on the detector
- communications are provided by Sigfox (AirSF-100S) and LoRa (AirSF-100L) networks
- battery power
- data are displayed in a smart phone application or ELKO Cloud

## Universal Sensor

AirIM-100S, AirIM-100L, AirIM-100Nb

- monitor the current level
- It warns against critical values in a timely manner
- communications are provided by Sigfox (AirIM-100S), LoRa (AirIM-100L) and NB-IoT (AirIM-100Nb) networks
- battery power/permanent power supply  
5 - 12 V DC
- in IP65 enclosure (Protection against water, dust, ...)
- only one sensor can be connected to the AirIM
- technical parameters see Page 11

Examples of use:



### Technical parameters - Flood detector

#### Power supply

Battery power:	2x 1.5 V AAAA battery
Battery life:	approx. 3 years (according to the frequency of use)

#### Settings

Alarm detection:	Use ELKO Cloud or Smartphone application
View battery status:	In Smartphone or ELKO Cloud

#### Indication

- Red LED:	broadcast
Sensor:	contact for flooding

#### Communication

Protocol:	Sigfox, RCZ1 (AirSF-100S)	LoRa (AirSF-100L)
Range in open space:	coverage 50 km	coverage 10 km

#### Other data

Working temperature:	0 ... +50 °C*
Storage temperature:	-30 ... +70 °C
Operating position:	sensor contacts for downward flooding
Mounting:	freely
Protection:	IP20
Dimension:	25 x 75 x 16 mm

\* Pay attention to the operating temperature of batteries.

# Inventory monitoring, relocation, ...

**Windows and doors are an easy target for uninvited visitors, so it's good to have everything under control.**

The detector consists of two parts - the main housing and magnetic. The main housing enables all communication and monitors the position of the magnet in the magnetic part. The alarm will be triggered when the magnet is removed from the main housing so you informed about the unwanted movement and you can react quickly to it.

Although the detector is primarily designed for windows and doors in remote buildings, cellars, or substations, it can also be used to monitor movable property or when you want to know that inventory is moving.



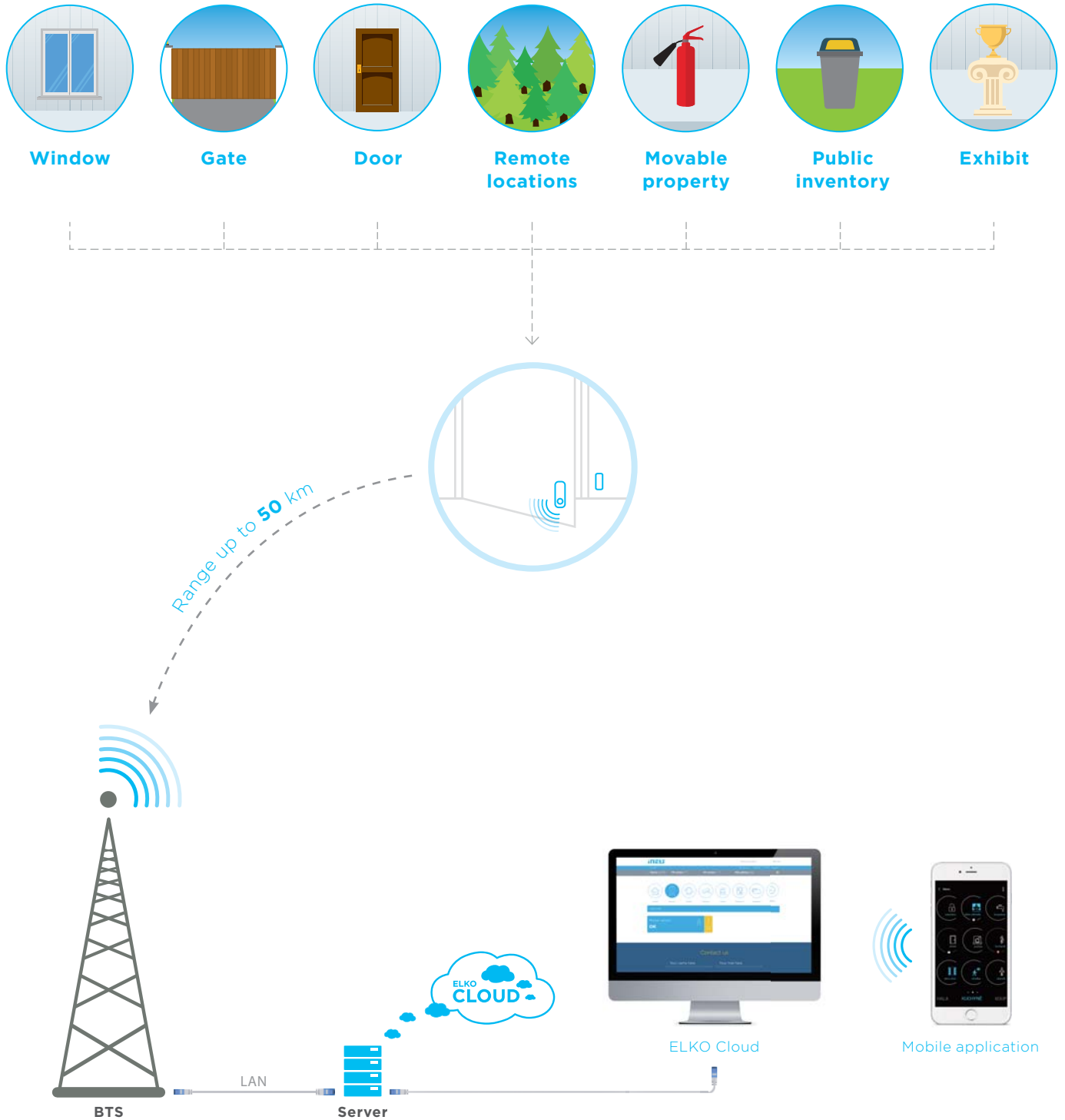
## Magnetic detector

AirWD-100S, AirWD-100L

- activation occurs by removing the magnet from the sensor
- communications are provided by Sigfox (AirWD-100S) and LoRa (AirWD-100L) networks
- data are displayed in a smart phone application or ELKO Cloud
- battery power



## Examples of use:



### Technical parameters - Magnetic detector

#### Power supply

Battery power	2x 1.5 V AAAA battery
Battery life:	approx. 3 years (according to the frequency of use)

#### Settings

Alarm detection:	Use ELKO Cloud or Smartphone application
View battery status:	In Smartphone or ELKO Cloud

#### Indication

- Red LED:	broadcast
Sensor:	magnetic

#### Communication

Protocol:	Sigfox, RCZ1 (AirWD-100S)	LoRa (AirWD-100L)
Range in free space:	coverage 50 km	coverage 10 km

#### Other data

Working temperature:	0 ... +50 °C*
Storage temperature:	-30 ... +70 °C
Operating position:	vertical
Mounting:	glue / freely
Protection:	IP20
Dimension:	25 x 75 x 16 mm / 15 x 75 x 14 mm

\* Pay attention to the operating temperature of batteries -65 ... 80 °C.

# Motion detector

**Keep control before the intrusion of strangers and cottages, barns, for example, the substation which you look into once in a while.**

The motion detector will guard these areas for you. Using a key fob, you simply unlock these areas when you are present, and when you exit you use the key fob again to activate the detector.

In addition, one detector can be paired with multiple key fobs, so all members of your family or authorized person can have their own key fob.



Motion detector

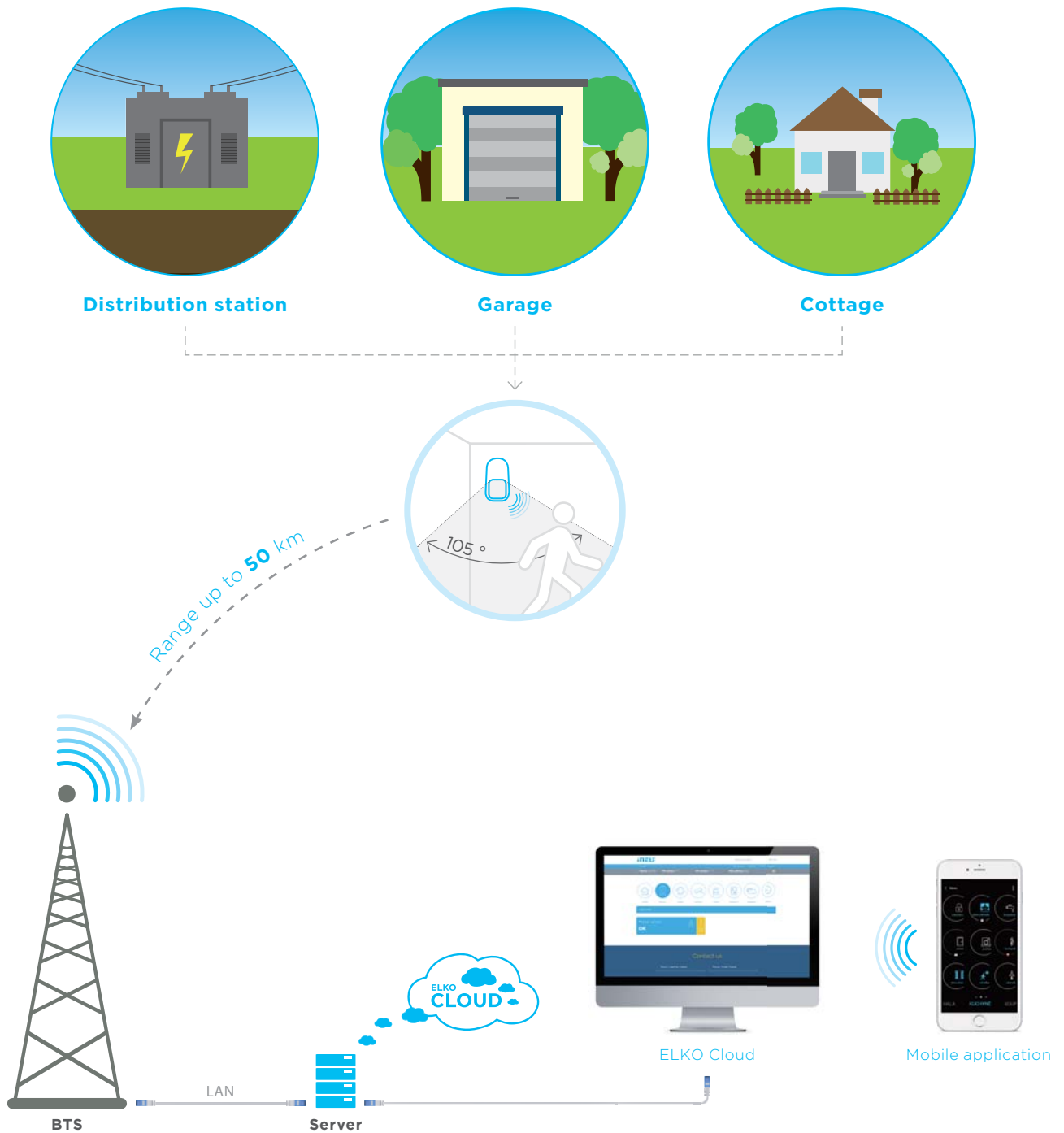
Key fob

AirMD-100S, AirMD-100L, AirIM-100Nb RF Key/W, RF Key/B

- detects people moving in a supervised area
- sensor sensitivity can be set
- communications are provided by Sigfox (AirMD-100S), LoRa (AirMD-100L) and NB-IoT (AirMD-100Nb) networks
- battery power
- data are displayed in a smart phone application or ELKO Cloud

- used to activate and deactivate the motion detector at the moment you leave or enter the guarded area

Examples of use:



### Technical parameters - Motion detector

#### Power supply

Battery power:	battery 2x 1,5 V AA
Battery life:	min. 1 year (according to the frequency of use)

#### Settings

Alarm detection:	Use ELKO Cloud or Smartphone application
View battery status:	In Smartphone or ELKO Cloud

#### Indication

- Red LED:	broadcast
Controlling:	DIP Switch (communication test)
Detection angle:	105°
Detection distance:	max. 12 m
Recommended working height:	max. 2,2 m

#### Communication

Sending RF communication packet:	868.5 MHz		
Protocol:	iNELS RF Control		
Range in free space:	up to 100 m		
Protocol:	Sigfox, RCZ1 (AirMD-100S)	LoRa (AirMD-100L)	NB-IoT (AirMD-100Nb)
Range in free space:	coverage 50 km	coverage 10 km	coverage 50 km

#### Other data

Working temperature:	0 ... +50 °C*
Storage temperature:	-30 ... +70 °C
Operating position:	vertical
Mounting:	screwing / glue / freely
Protection:	IP20
Dimension:	46 x 105 x 43 mm

\* Pay attention to the operating temperature of batteries -65 ... 80 °C.

# Smoke detector

**The kitchen and living room are the two most frequently used room in which are also the most appliances. Therefore, it is natural to have these rooms protected from any resulting fire.**

The smoke detector alerts you to any emerging fire, allowing you to respond and protect not only the people in the area but also your property in a timely manner.

After the smoke detection of an emerging fire, it instantly transmits this information to your smartphone and also to your ELKO Cloud. Therefore, its use also plays an important role in monitoring remote areas, such as free-standing garages, barns or power stations, where you look only once in a while.

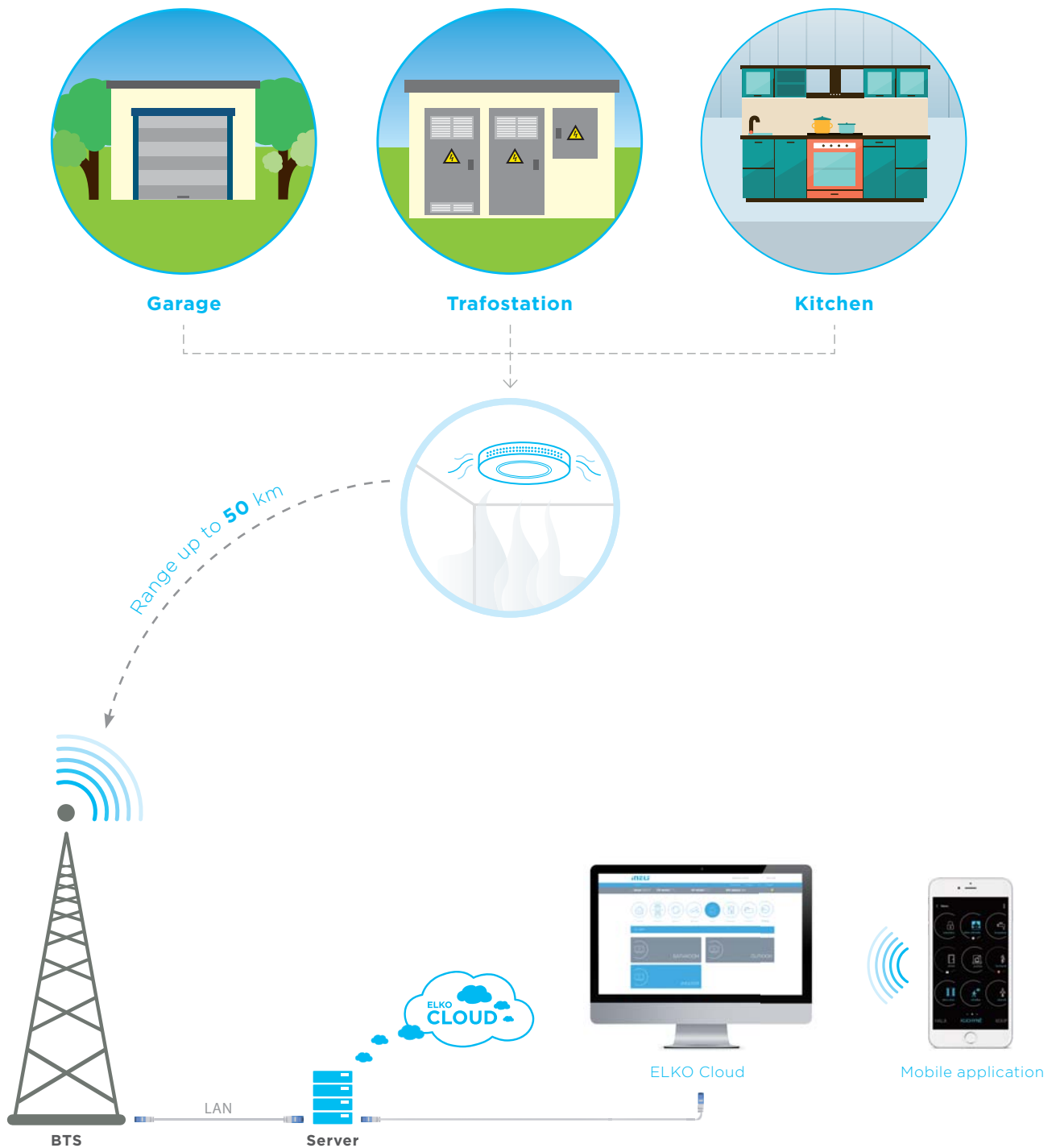


## Smoke detector

AirSD-100S, AirSD-100L

- smoke detection in the result of fire
- automatic testing of functionality
- communications are provided by Sigfox (AirSD-100S) and LoRa (AirSD-100L) networks
- data are displayed in a smart phone application or ELKO Cloud
- battery power

## Examples of use:



### Technical parameters - Smoke detector

#### Power supply

Battery power:	battery 4x 1,5 V AA
Battery life:	min. 1 year (according to the frequency of use)

#### Settings

Alarm detection:	Use ELKO Cloud or Smartphone application
View battery status:	In Smartphone or ELKO Cloud

#### Indication

- Red LED:	broadcast
Controlling:	DIP Switch (Test komunikace)
Detection area:	max. 40 m <sup>2</sup>
Recommended working height:	max. 7 m

#### Communication

Protocol:	Sigfox, RCZ1 (AirSD-100S)	LoRa (AirSD-100L)
Range in free space:	coverage 50 km	coverage 10 km

#### Other data

Working temperature:	0 ... +50 °C*
Storage temperature:	-30 ... +70 °C
Operating position:	horizontally
Mounting:	glue / freely
Protection:	IP20
Dimension:	Ø 120 x 36 mm

\* Pay attention to the operating temperature of batteries -65 ... 80 °C.

# Surrounding Air quality

**Impurities in the air are among one of the basic environmental problems. Some substances also have a negative effect on human beings.**

Even one person in a poorly ventilated room, by breathing, will soon increase the carbon dioxide (CO<sub>2</sub>) concentration to a detrimental level. Higher concentrations can cause headache, affect the ability to concentrate, drowsiness, or worse.

Conversely, carbon monoxide (CO) is produced by incomplete combustion and is very dangerous for human beings. This gas is also produced by cigarettes or aromatic rods.

Our sensors will allow you to easily measure these concentrations and react to an undesirable amount in a timely manner. They can also be part of a master system.



Air quality  
sensor - CO<sub>2</sub>

AirQS-100S, AirQS-100L

- measurement of the concentration of CO<sub>2</sub> which, in large quantities, can cause headache, affect the ability to concentrate, drowsiness, or worse
- information about actual temperature and humidity
- automatic testing of functionality
- communications are provided by Sigfox (AirQS-100S) and LoRa (AirQS-100L) networks
- permanent power supply 12-240 V AC/DC

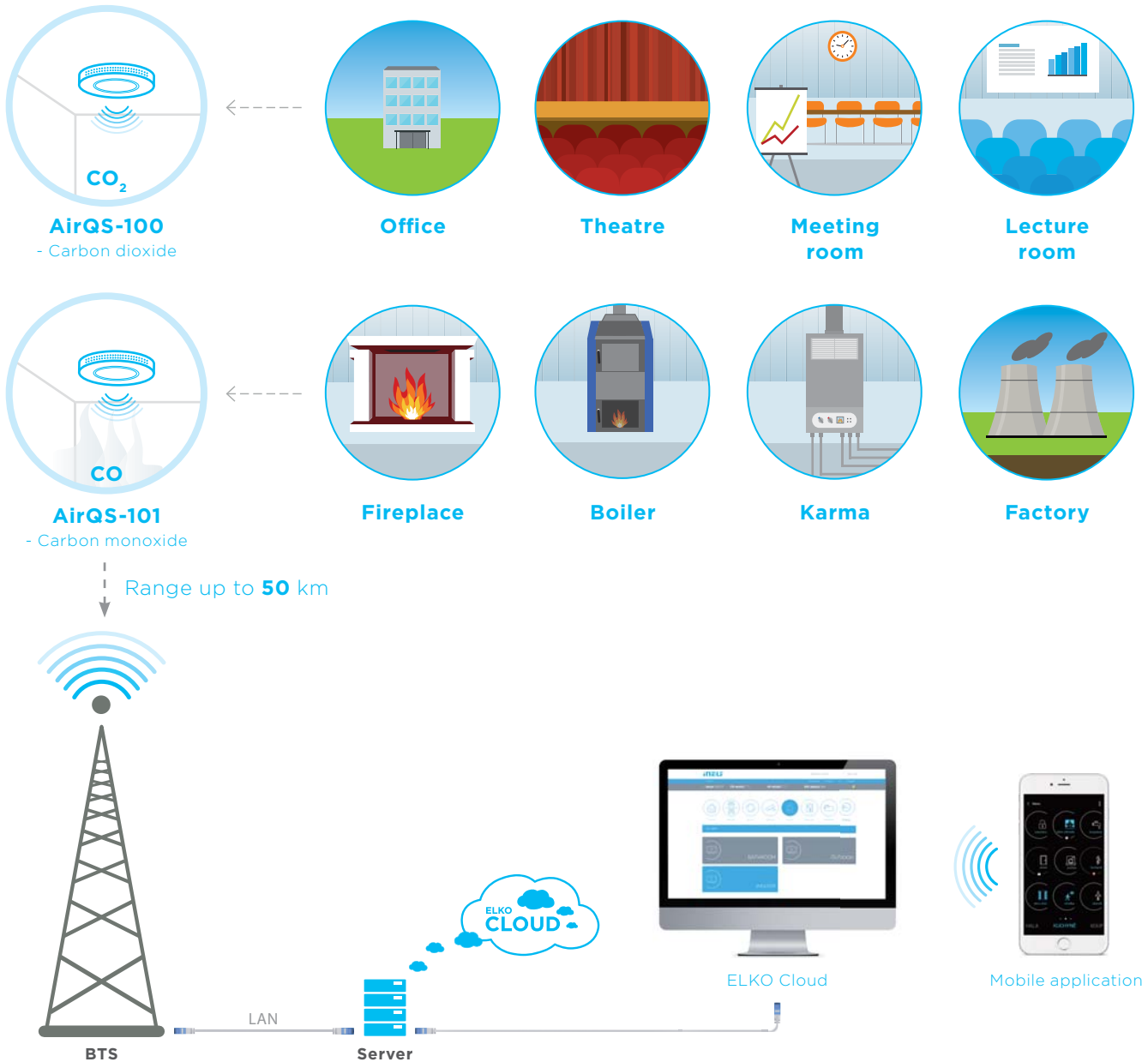


Air quality  
sensor - CO

AirQS-101S, AirQS-101L

- a security component for monitoring the CO concentration resulting from incomplete combustion
- information about actual temperature and humidity
- communications are provided by Sigfox (AirQS-101S) and LoRa (AirQS-101L) networks
- data are displayed in a smart phone application or ELKO Cloud
- battery power

## Examples of use:



### Technical parameters - Air quality sensor

Power supply	CO <sub>2</sub>	CO
Battery power:	x	battery 4x 1.5 V AA
Battery life:	x	min. 1 year
External power:	12 - 240 V AC / DC	x
Settings		
Alarm detection:	Use ELKO Cloud or Smartphone application	
View battery status:	In Smartphone or ELKO Cloud	
Indication		
- Red LED:	broadcast	
Controlling:	DIP Switch (communication test)	
Detection area:	max. 40 m <sup>2</sup>	
Recommended working height:	max. 7 m	
Input		
Measurement of concentration:	x	yes
Sensitivity:	x	0 - 10 000 ppm
Accuracy:	x	5% (0 - 500 ppm)
Measurement of concentration:	yes	x

Sensitivity:	400 - 4 000 ppm	x
Accuracy:	5% (0 - 180 ppm)	x
Temperature measurement:	yes, built-in sensor	
Sensitivity:	-25 ... +110 °C	
Accuracy:	± 3 °C	
Humidity measurement:	yes, built-in sensor	
Sensitivity:	0 .. 90 % RH	
Accuracy:	± 4 %	

### Communication

Protocol:	Sigfox, RCZ1 (AirQS-100S)	LoRa (AirQS-100L)	Sigfox, RCZ1 (AirQS-101S)	LoRa (AirQS-101L)
Range in free space:	coverage 50 km	coverage 10 km	coverage 50 km	coverage 10 km

### Other data

Working temperature:	0 ... +50 °C*
Storage temperature:	-30 ... +70 °C
Operating position:	horizontally
Mounting:	glue / freely
Protection:	IP20
Dimension:	Ø 120 x 36 mm

\* Pay attention to the operating temperature of batteries -65 ... 80 °C.

# Measurement and monitoring of energy

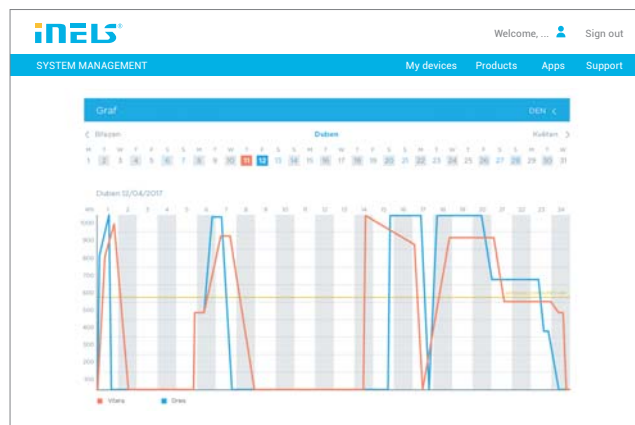
**Monitoring of energy due to the ever increasing cost is among the important aspects of every object or property.**

Wireless sensors are installed directly on to the water meter, gas meter and electrical meter without damaging their seals. Pulses and data are converted to wireless commands that are transmitted via ELKO Cloud Internet Networks, where they are further processed and evaluated.

You can also set a notification when you exceed the set (critical) parameters using the smartphone application.



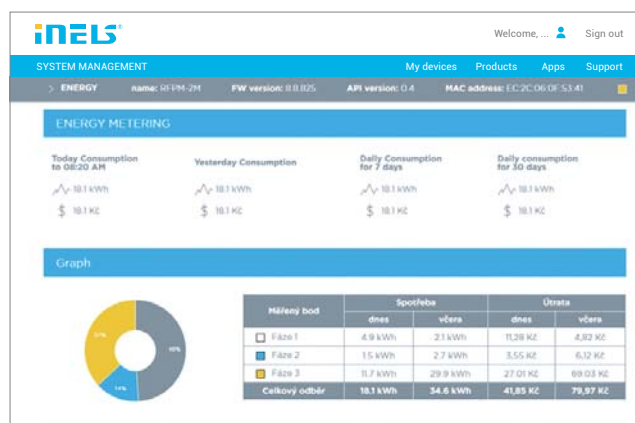
## ELKO Cloud



## Pulse transmitter

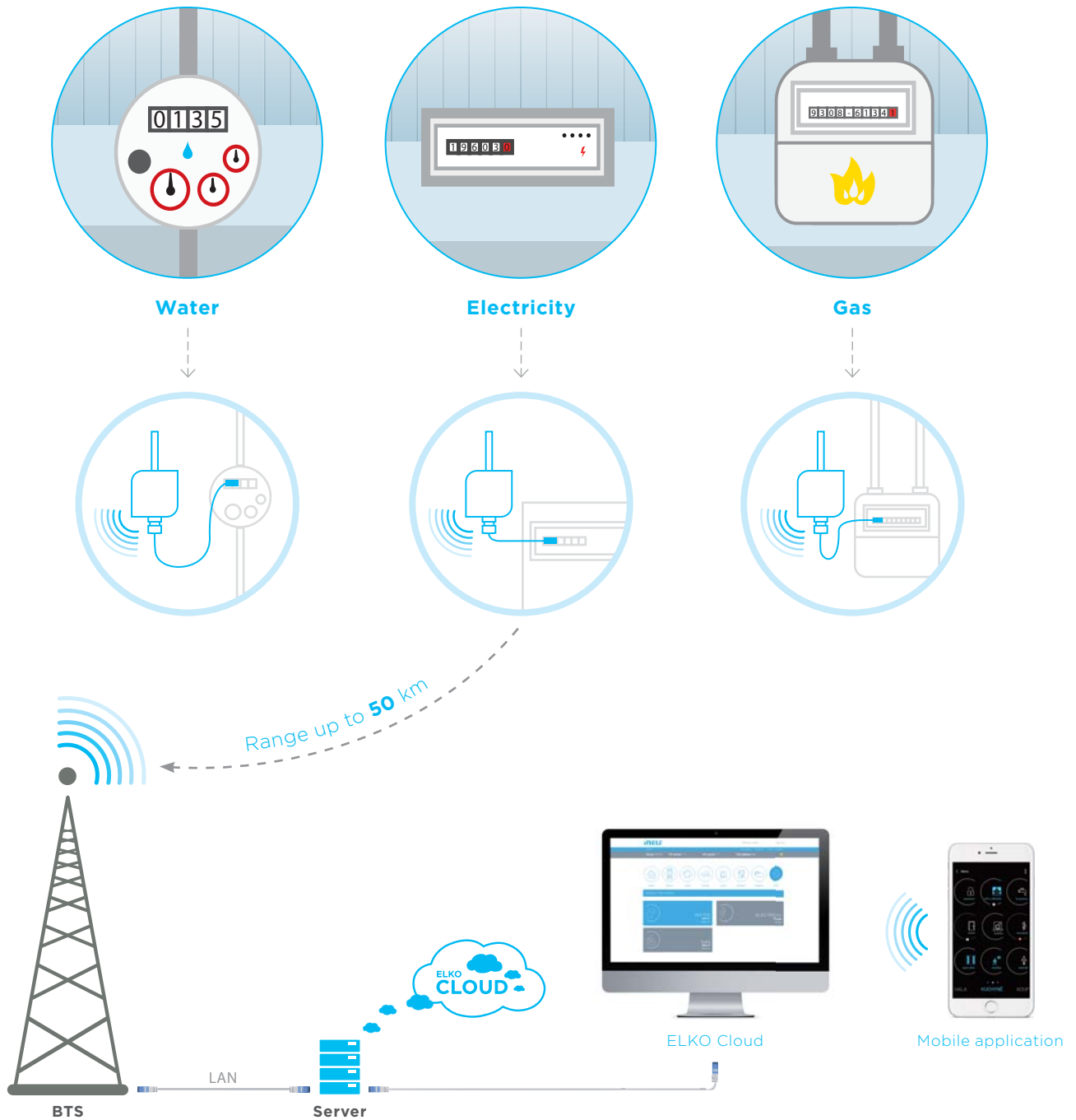
AirTM-100S, AirTM-100L, AirTM-100Nb

- a wireless pulse transmitter designed to scan data from home energy meters
- communications are provided by Sigfox (AirTM-100S), LoRa (AirTM-100L) and Nb-IoT (AirTM-100Nb) networks
- data are displayed in a smart phone application or ELKO Cloud
- battery power
- in IP65 enclosure (Protection against water, dust, ...)
- supported sensors: LS (LED sensor); MS, WS (magnetic sensor); IRS (IR sensor); SO (contact) - for more information see page 36





## Examples of use:



### Technical parameters - Pulse transmitter

#### Power supply

Battery supply:	1x 3.6 V battery SAFT LS 14500
Battery life:	Appr. 5 years, (According to the type and frequency of scan)
External power supply:	5-12 V DC (On the clamp)
Supply voltage tolerances:	+10%, -15%
Quiet consumption:	0,2 mW
Transmitting power consumption:	150 mW

#### Indications

- Red LED:	broadcast
- Green LED:	pulse / indication of reception

#### Controlling

Controlling:	button SET - sensor setting / communication test
Sensor Selection:	using setting pins

#### Connection

Connection of the sensor:	terminals, wires 0.5 - 1 mm <sup>2</sup>
Supported sensors* (For more information see p. 32)	LS (LED sensor); MS, WS (magnetic sensor); IRS (IR sensor)

#### Communication

Protocol:	Sigfox, RCZ1 (AirTM-100S)	LoRa (AirTM-100L)	NB-IoT (AirTM-100Nb)
Range in free space:	coverage 50 km	coverage 10 km	coverage 50 km

#### Other data

Working temperature:	-30 ... +50 °C**
Storage temperature:	-30 ... +70 °C
Operating position:	any
Protection:	IP65
Grommet:	M16 x 1,5 for cable ø max. 10 mm
Dimension (without antenna):	182 x 62 x 34 mm (96 x 62 x 34 mm)

\* Not included in the package.

\*\* Pay attention to the operating temperature of batteries -65 ... 80 °C.

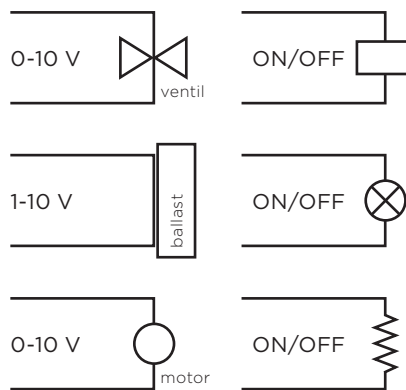
# Control of appliances

**You can control a variety of electrical devices such as water boilers, electric heaters, and lighting.**

The main advantage of installing the switching device with communication over the Internet of Things is the switching and controlling of appliances, even remotely. Indulge yourself in the comfort of a warm chalet at the moment of your arrival.

Open your home gate or illuminate the driveway when you are arriving back home by just pressing a button in your smartphone application.

When the switching device is switched off, the set level is stored in the memory and, when it is switched on again, returns to the set value.



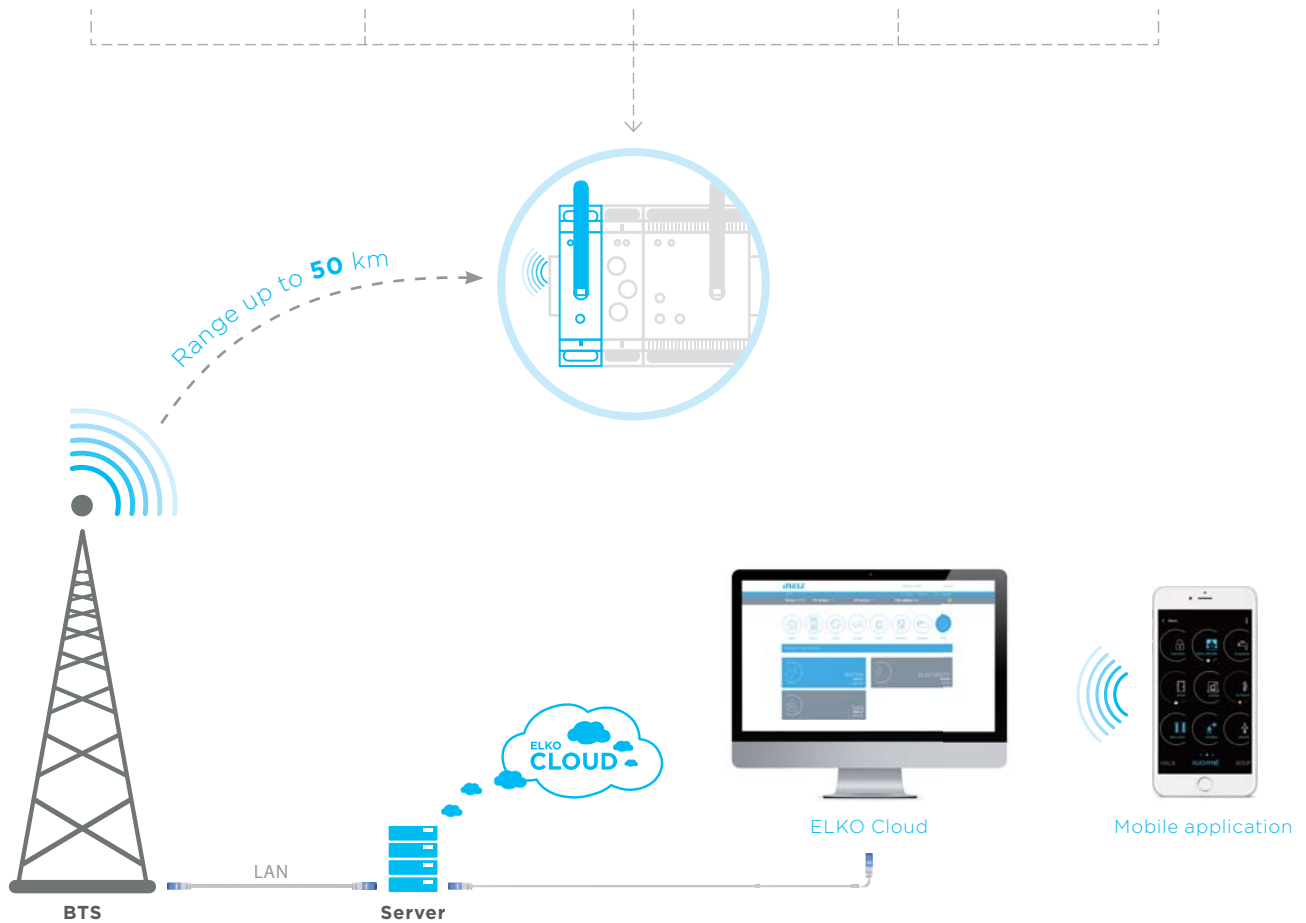
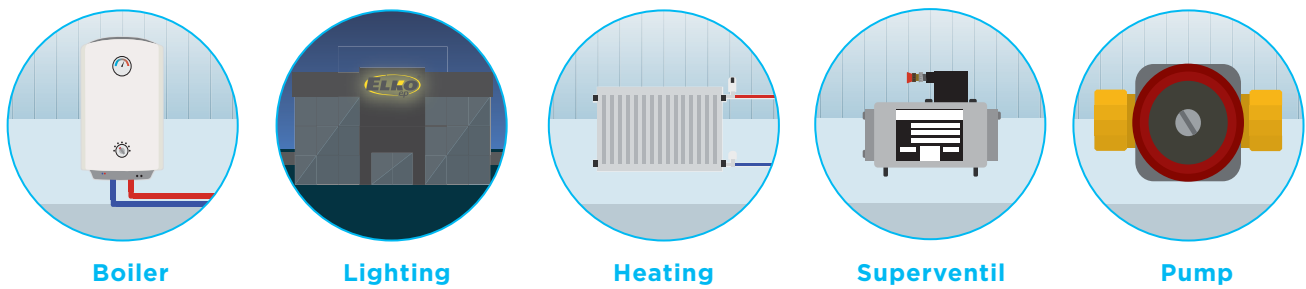
## Control device

AirDAC-100L/M

- for remote switching of appliances
- control by analogue signal 0 (1) -10 V
- communications are provided by LoRa (AirDAC-100L/M) network
- data are displayed in a smart phone application or ELKO Cloud
- permanent power supply 24-240 V AC
- 1-MODUL, DIN rail mounting

switching: relay 16 A, potential A1  
analog: 0-10 V, 10 mA  
output: 1-10 V, 10 mA

## Examples of use:



### Technical parameters - Control device

Power supply	
Supply voltage:	24 - 240 V AC / 50 - 60 Hz
Apparent input:	3 VA
Dissipated power:	1.2 W
Supply voltage tolerance:	+10 / -15 %
Potential-free analog output / max. current:	0(1)-10 V / 10 mA
Settings	
Settings:	Using a ELKO Cloud Message
Alarm detection:	Use ELKO Cloud or Smartphone application
View battery status:	In Smartphone or ELKO Cloud
Communication	
Protocol:	LoRa (AirDAC-100L/M)
Range in open space:	coverage 10 km
Controlling	
Contact relay:	1x AgSnO <sub>2</sub> , switches the phase conductor
Rated current:	16 A / AC1
Switched power:	4 000 VA / AC1
Switching voltage:	250 V AC1
Mechanical life of the relay:	3x10 <sup>7</sup>
Electrical life:	0.7x10 <sup>5</sup>
Indication:	red / green LED
Output:	0(1)-10 V
Test button:	short press - broadcasting test long press - relay 0(1) - 10 V
Other data	
Working temperature:	-15 ... +50 °C
Working position:	any
Mounting:	DIN rail EN 60715
Protection:	IP20 from front panel
Overvoltage category:	III.
Degree of pollution:	2
Output for antenna:	SMA connector*
Cross-section of connecting wires (mm <sup>2</sup> ):	max. 1x 2.5, max. 2x 1.5/ with a hollow max. 1x 2.5
Dimension:	90 x 17.6 x 64 mm

\* Max Tightening Torque for antenna connector is 0.56 Nm.

# Controlled dimming of lights

**Maintain a constant light intensity in a given area is for many of us a tough challenge...**

Using the dimming light sensor, you can simply capture data relating to the natural light and respond to it by utilising artificial lighting control, which also reduces electricity consumption. Thanks to its enhanced coverage and battery power, it can also be placed in outdoor areas and used in both residential and commercial projects - production or storage halls or greenhouses. You can also use the unit as the main component which can control a whole group of luminaires using the measured data.

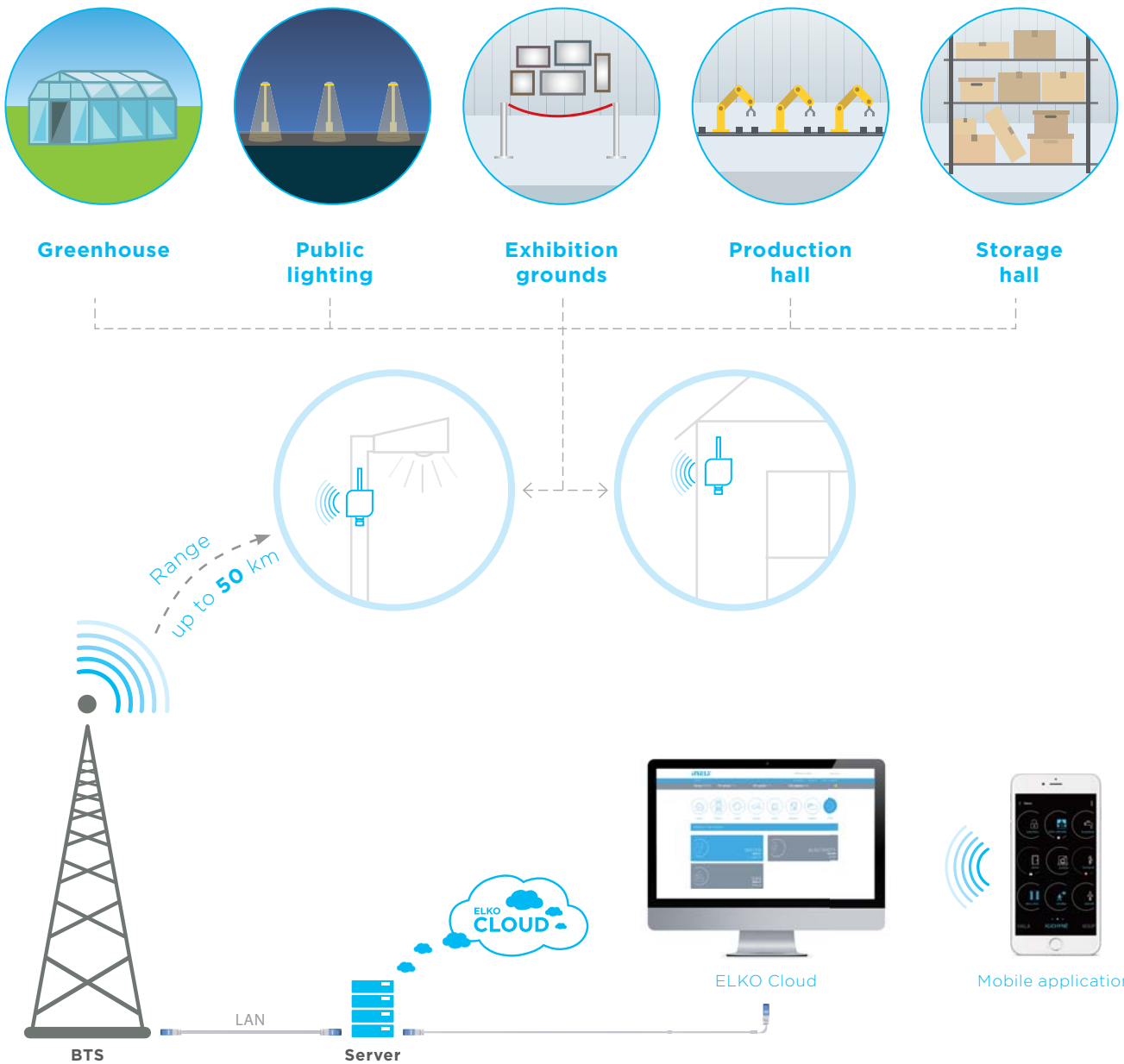


## Light dimming sensor

AirSOU-100S, AirSOU-100L

- allows you to capture the current natural light intensity, and with this information control the intensity of artificial lighting, thereby reducing power consumption.
- communications are provided by Sigfox (AirSOU-100S) and LoRa (AirSOU-100L)
- battery power
- enhanced IP65 protection (dust and splash protection)

## Examples of use:



### Technical parameters - Light dimming sensor

<b>Input</b>		Controlling:		button (communication test) Magnetic contact Tamper	
Light measurement range:	1 - 100 000 lx	<b>Communication</b>			
Detection angle:	100°	Protocol:	Sigfox, RCZ1 (AirSOU-100S)	LoRa (AirSOU-100L)	
<b>Power supply</b>		Range in free space:	max. 50 km	max. 10 km	
Battery power:	1x 3.6V battery LiSOC <sub>2</sub>	<b>Other data</b>			
Battery life:	min. 5 year (according to the frequency of use)	Working temperature:	-30...+60°C*		
Quiet consumption:	1 mW	Storage temperature:	-30...+70°C		
Transmission consumption:	115 mW	Operating position:	any		
<b>Settings</b>		Protection:	IP65		
Settings:	using a message from ELKO Cloud or using setting pins	Dimension with antenna/ without antenna:	156 x 62 x 34 mm / 70 x 62 x 34 mm		
Alarm detection:	use ELKO Cloud or Smartphone application				
View battery status:	In Smartphone or ELKO Cloud				
<b>Indication</b>					
- red LED:	broadcasting				
- green LED:	acceptance / control indication				

\* Pay attention to the operating temperature of batteries -60...+85 °C  
For the proper operation of the detector, it is necessary to eliminate any interfering light sources in the scanning area.

# Smart public lighting

**Smart public lighting is environmentally friendly, as well as being kind to your wallet.**

Replacing existing light sources with modern LED lights combined with intelligent control makes it possible to reduce the cost of electricity consumption by up to 80%. Thanks to the LoRa's modern network of communications, the lights can be controlled from up to 20 km. In addition to switching on and off, it is possible to control the intensity of lighting and also to diagnose a light defect. Using an oscilloscope, it can respond to ambient conditions. The component for public lighting simply attaches to the light or the mast and is immediately operational. Control can be performed from the control room by using cloud applications, in the field by tablet or smartphone.



## Two-directional communication module

AirSLC-100L, AirSLC-100Nb

- a component for switching public lighting in a city, area, car park
- communications are provided LoRa (AirSLC-100L) and NB-IoT (AirSLC-100Nb) networks
- data are displayed in a smart phone application or Cloud
- permanent power supply 110-230 V AC
- in IP65 enclosure (Protection against water, dust, ...)



## Outdoor receiver

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
- communications are provided LoRa (AirSLC-100L/Plug/EU (US) and NB-IoT (AirSLC-100Nb/Plug/EU (US) networks

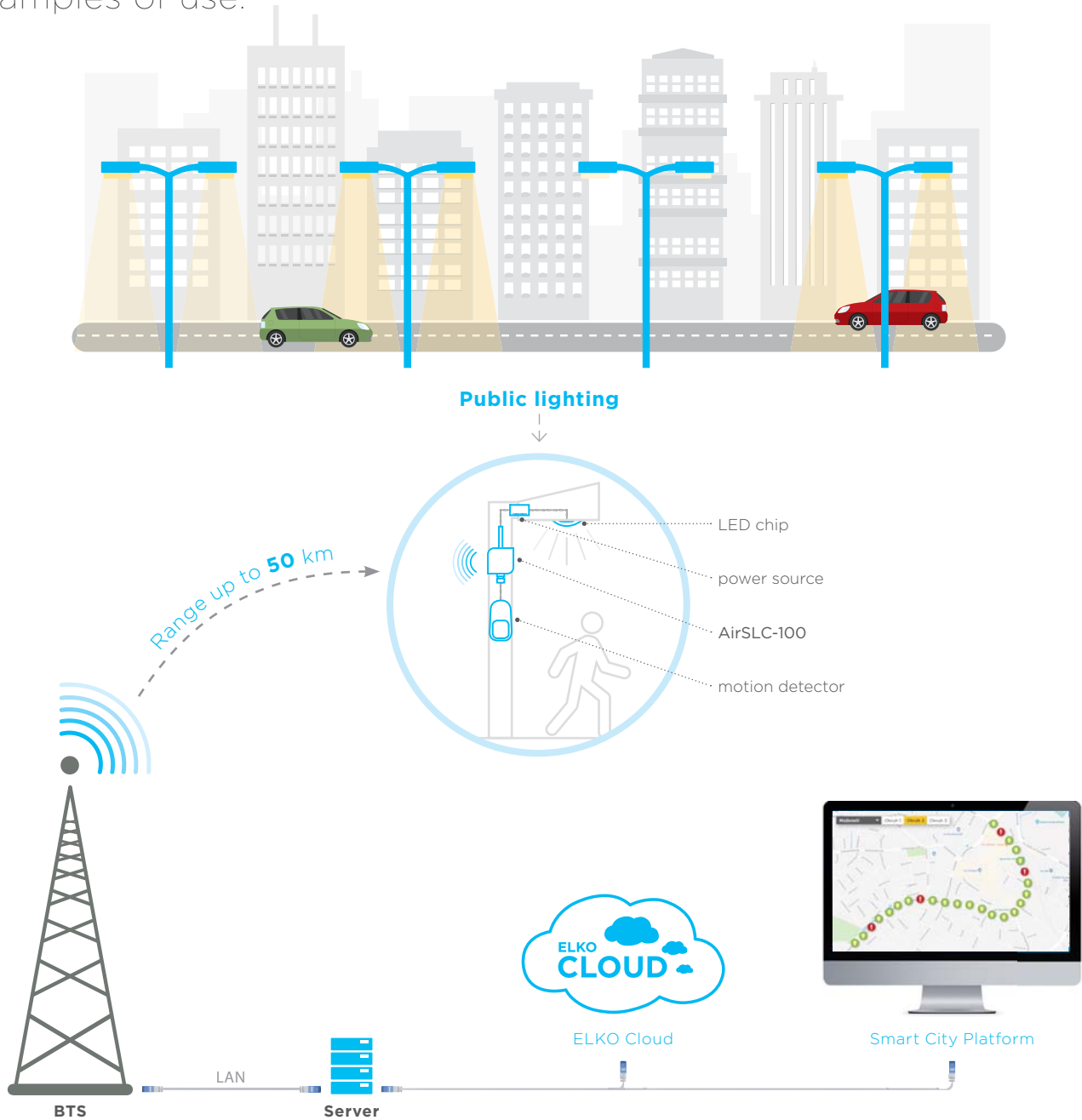


## Built-in board

LoRAWAN Modul OEM

- connection: soldering pins
- Power supply: 5-24VDC, after breaking source parts only stabilized 3V3 / 140mAh
- dimensions:
  - 19.5 x 46.1 x 4 mm with ULF connector
  - 19.5 x 57 x 7 mm with SMA connector
  - 19.5 x 46.1 x 21 mm with internal antenna
- antenna: external UFL or SMA connector, internal bent parts of the product
- communications are provided LoRa (LoRAWAN Modul OEM) network

## Examples of use:



### Technical parameters - Two-directional communication module

#### Power supply

Supply voltage:	110-230 V AC / 50-60 Hz
Apparent input:	3 VA
Dissipated power:	1.2 W
Supply voltage tolerance:	+10 / -15 %
Potential-free analog output/max. current:	0(1)-10 V / 10 mA

#### Settings

Alarm detection:	Use ELKO Cloud or Smartphone application
View battery status:	In Smartphone or ELKO Cloud

#### Controlling

Contact relay:	1x AgSnO <sub>2</sub> switched the phase conductor
Rated current:	16 A / AC1
Switched power:	4 000 VA / AC1
Switching voltage:	250 V AC1
Mechanical life of the relay:	3x10 <sup>7</sup>

Electrical life:	0.7x10 <sup>5</sup>
Indication:	red / green LED
Output selection:	0(1)-10 V / button PROG

#### Communication

Protocol:	LoRa (AirSLC-100L)	NB-IoT (AirSLC-100Nb)
Range in open space:	coverage 10 km	coverage 50 km

#### Other data

Working temperature:	-15 ... +50 °C
Working position:	any
Mounting:	free at lead-in wires
Protection:	IP65
Overvoltage category:	III.
Degree of pollution:	2
Leads (wire CY, cross section):	3 x 2.5 mm <sup>2</sup> , 2 x 0.75 mm <sup>2</sup>
Length of outlets:	90 mm
Grommet:	M16 x 1,5 for cable ø max. 10 mm
Dimension (without antenna):	182 x 62 x 34 mm (96 x 62 x 34 mm)

# Smart parking

## **Finding a free parking space in today's crowded cities is almost a miracle...**

A total of 20% of drivers in urban traffic are just looking for a place to park. However, their cars cannot easily reach free spaces. The solution is to install parking sensors that use state-of-the-art technology. In conjunction with the service application, you have a solution that will free the streets of your city. Sensors located on individual parking spaces detect occupancy; the application navigates cars to vacancies, and in the case of charging customers can also pay parking fees. The installation of sensors is simple; it takes about 20 minutes with the necessary equipment. Our parking sensors can be used in corporate parking lots, car parks at department stores or administrative complexes.



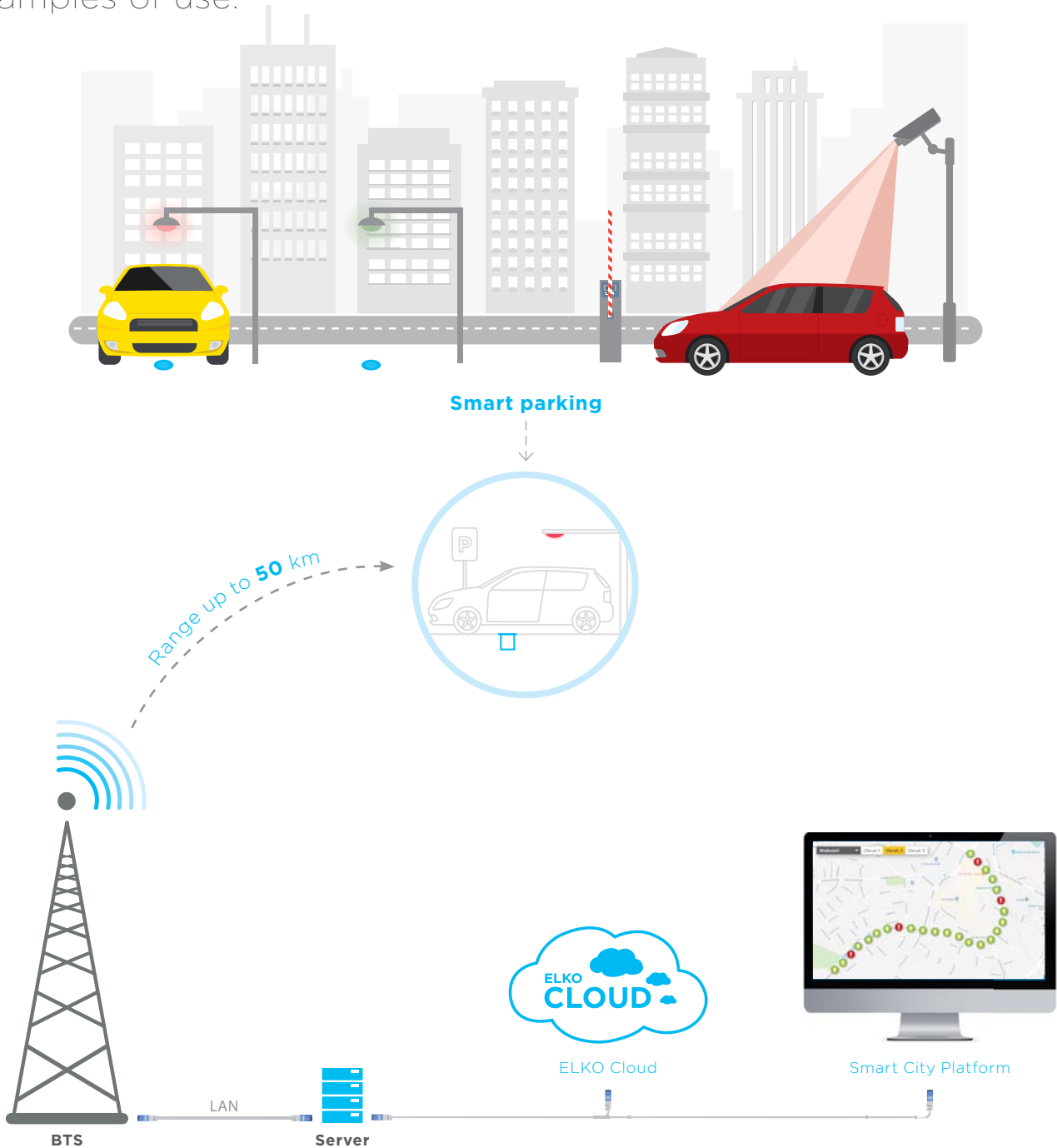
## Parking sensor

AirPS-100S

- detects a free or occupied parking space utilising the magnetic principle
- communication is provided by the Sigfox network (AirPS-100S)
- view data in the Cloud, Smart City platform, or via a smartphone application
- battery power with a lifetime of about 10 years
- enhanced IP67 protection



Examples of use:



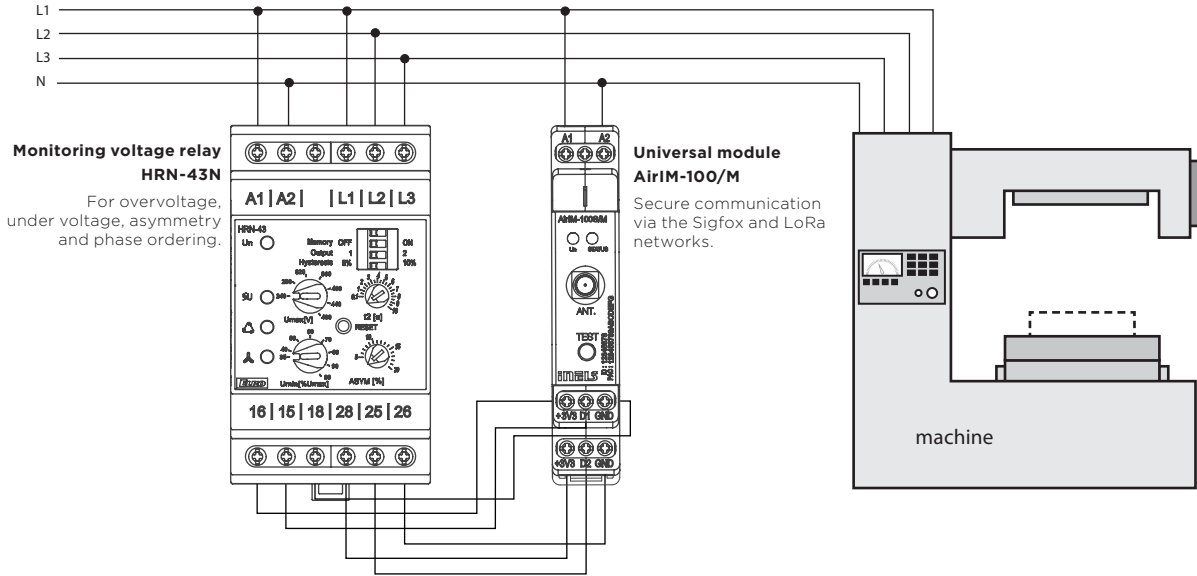
### Technical parameters - Parking sensor

<b>Power supply</b>	non-removable battery		<b>Protocol:</b>	Sigfox RCZ1
Battery power:	4x 3.6V LiSOCL2 (30 800 mAh)		<b>Range in open space:</b>	coverage 10 km
Battery life:	Approx. 10 years, depending on the setting		<b>Sending RF communication packet:</b>	868.5 MHz
View battery status:	in ELKO Cloud		<b>Other data</b>	
<b>Settings</b>	Using a message from ELKO Cloud with RF command			
<b>Indication</b>	Using a ELKO Cloud Message			
<b>Detection</b>				
Detection principle:	magnetic		<b>Working temperature:</b>	-30 ... + 85 °C
Detection distance:	0 - 50 cm		<b>Operating position:</b>	Push into the road (ground level) *
Theft detection:	yes		<b>Pressure load:</b>	up to 1 000 kg
Temperature measurement:	yes		<b>Protection:</b>	IP67
<b>Communication</b>				
Protocol:	iNELS RF Control		<b>Resistance to external influences:</b>	UV, salt, snow plough
Range in open space:	up to 100 m		<b>Dimension:</b>	Ø 90 x 90 mm

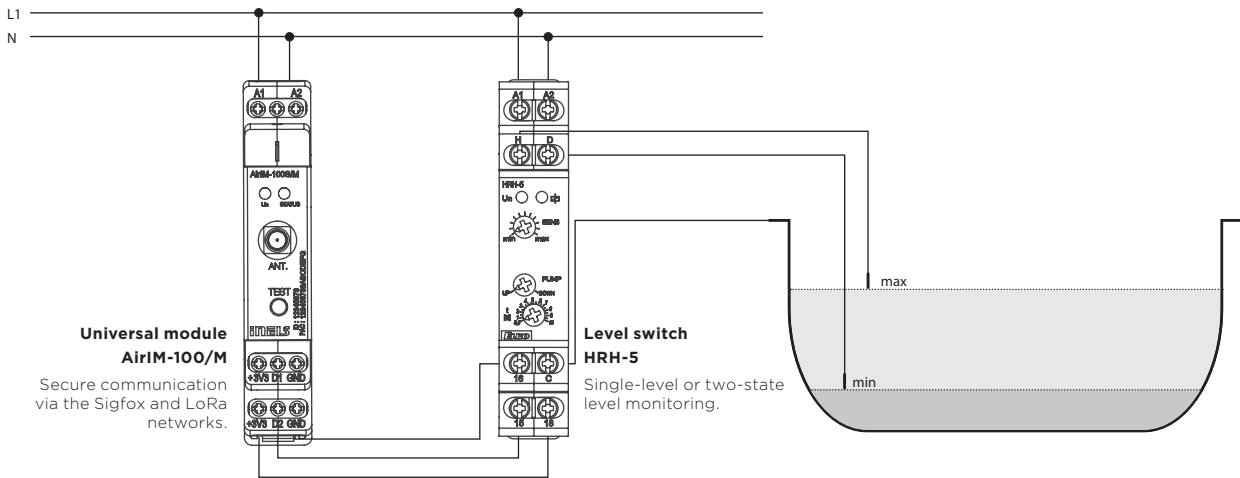
\* Minimum distance from metal objects (channel) - 1m.

# Examples of connections

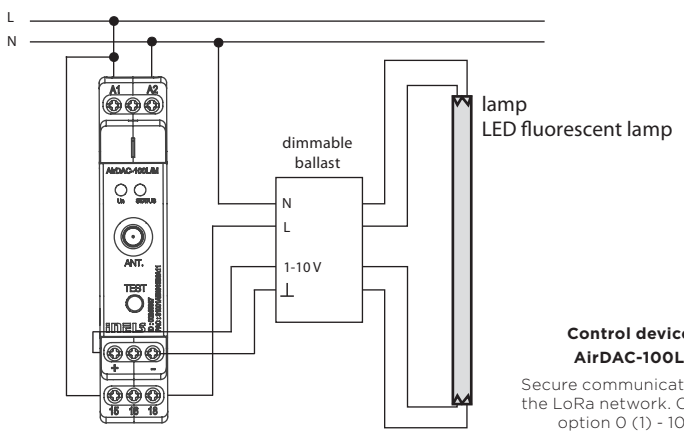
## 3-phase network monitoring



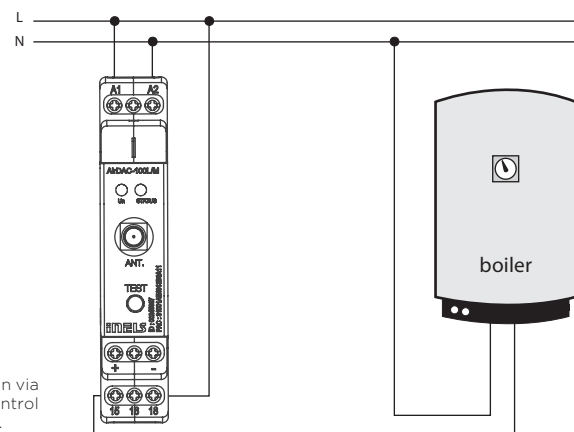
## Surveillance



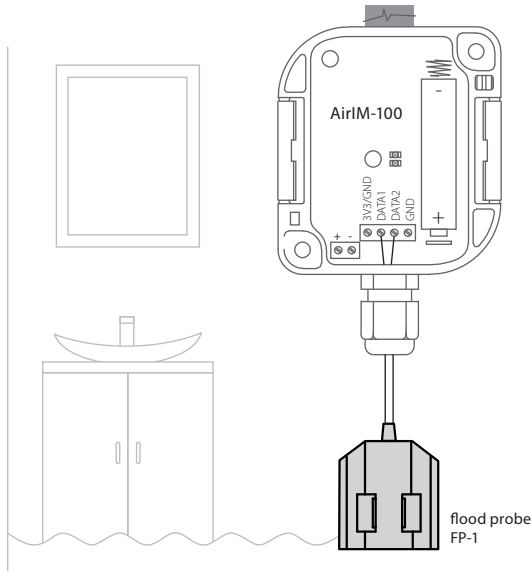
## Regulation of lamps with dimmable ballast



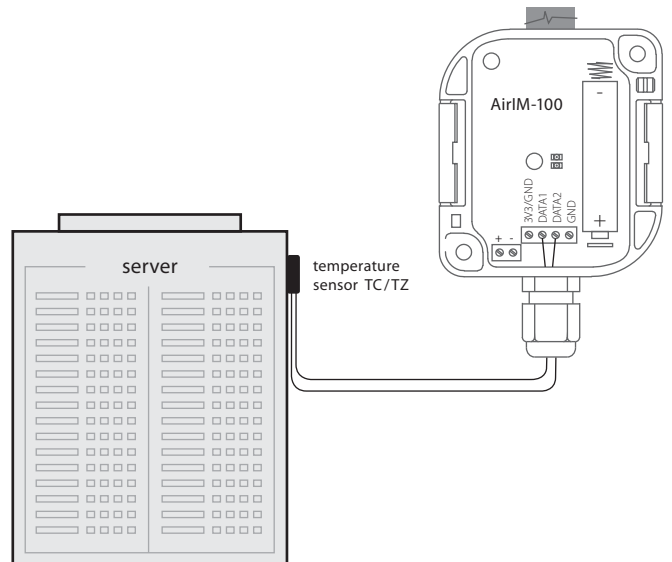
## Controlling the boiler



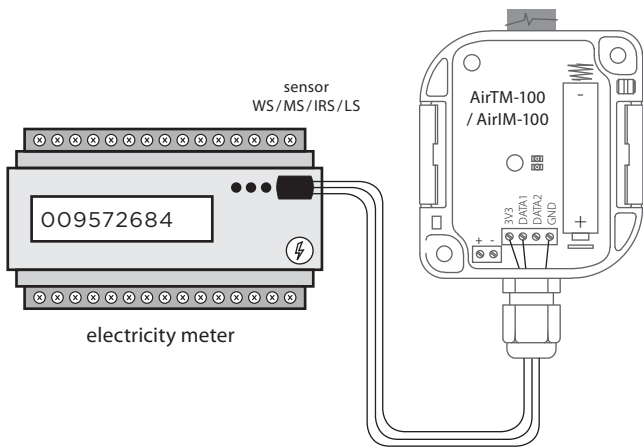
## Monitoring the flood



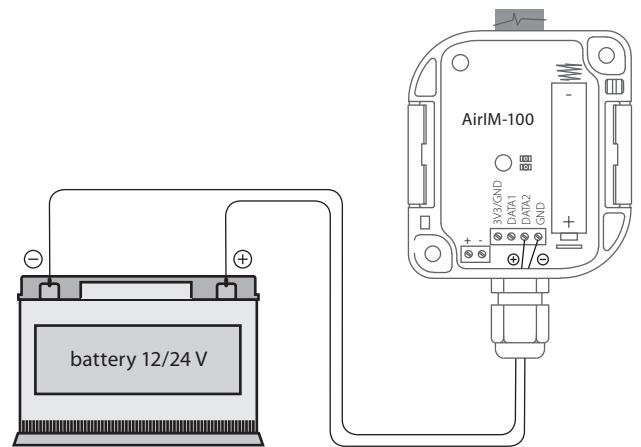
## Temperature monitoring



## Measurement of energy (water, electricity, gas)

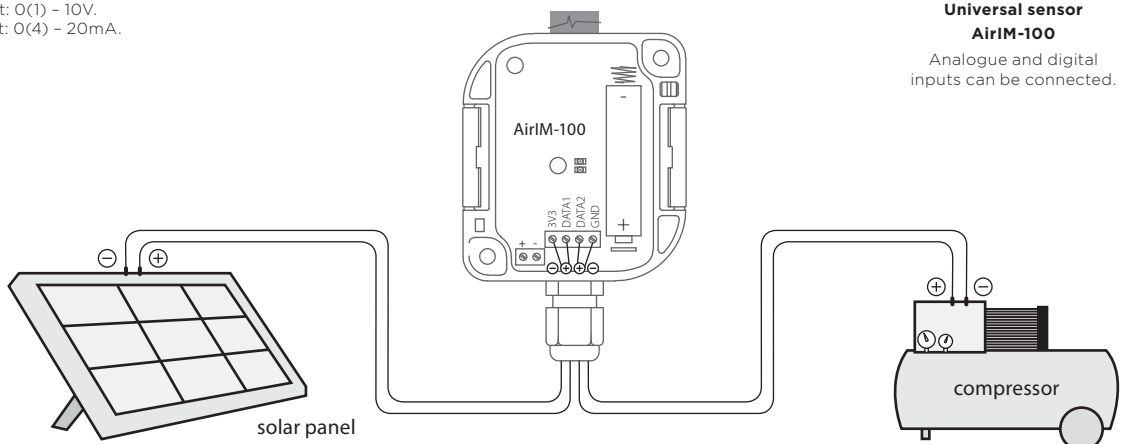


## Battery and battery voltage measurement



## Current/voltage measurement

Voltage input: 0(1) - 10V.  
Current input: 0(4) - 20mA.





## Sensors



Temperature sensor

TC

- sensor TC
  - lead-in cable to sensor TC is made of wire CYSY 2D x 0.5 mm/ 0.02"



Temperature sensor

TZ

- sensor TZ
  - cable VO3SS-F 2D x 0.5 mm /0.02" with silicone insulation for use in high temperature applications.
  - silicone insulation for use in high temperature applications.



Level sensors

FP-1, NL-100

- FP-1
  - flood probe
  - detects flooding when the electrodes are flooded, the subsequent signal is sent to one of the evaluation units
- NL-100
  - plastic float sensor



## Monitoring relays



Monitoring voltage relay

HRN

- voltage monitoring (overvoltage and under voltage) in 1-phase and 3-phase networks
- depending on the type selected, the supply voltage can be adjusted
- overview of all types of HRN can be found in Modular electronic devices technical catalog



Monitoring current relay

PRI

- monitoring of the current passing through individual appliances
- overview of all types of PRI can be found in Modular electronic devices technical catalog



Level switch

HRH

- relays designed for level control in wells, tanks, tankers and reservoirs
- one-state, two-state or independent level monitoring can be selected according to the selected switch
- overview of all types of HRH can be found in Modular electronic devices technical catalog



Modular electronic devices

- overview of all types of relays can be found in Modular electronic devices technical catalog



## Sensors for energy measurements



LED sensor

LS

- the LED sensor scans LED impulses on the meter, which indicates consumption by flashing



Magnetic sensor

MS, WS

- the magnetic sensor scans the movement of the numeral, upon which a permanent magnet is placed



Infra Red sensor

IRS

- the IR sensor senses the reflective curtain placed on the moving number of the meter or senses the rotating indicator (mainly on water meters)



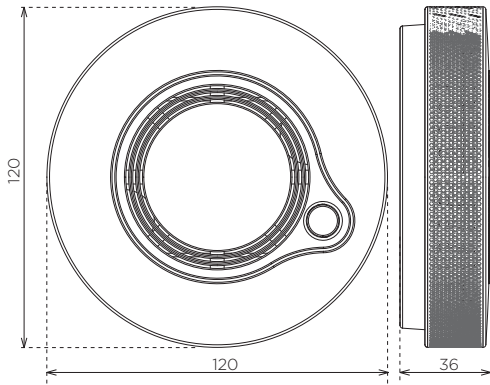
Output „SO“

IMP

- meters with impulse output indicated as „SO“ connected by wires to terminals GND and DATA1 on the sensor AirTM-100

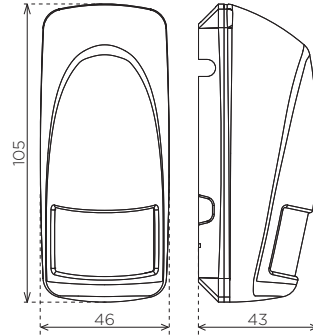
# Product dimensions

Detector



AirSD-100S/L  
AirQS-100S/L  
AirQS-101S/L

Detector

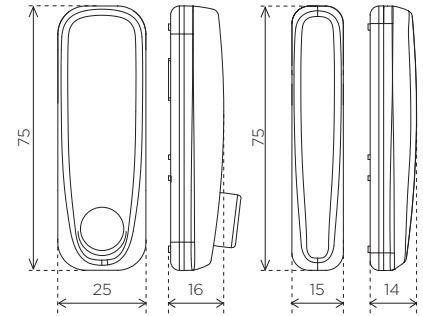


AirMD-100S/L/Nb

Detector

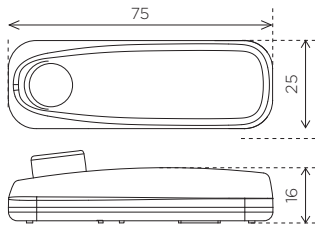
- sensor

- magnet



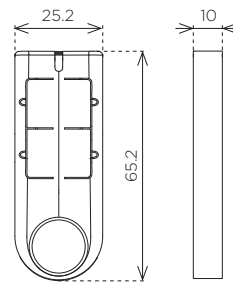
AirWD-100S/L

Detector



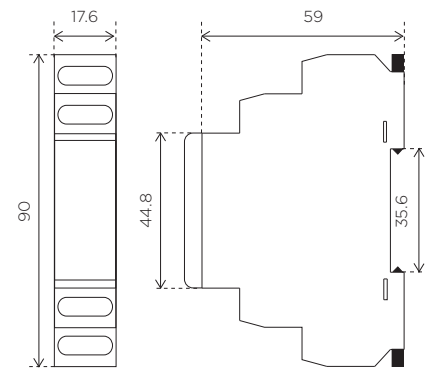
AirSF-100S/L

Key fob



RF Key

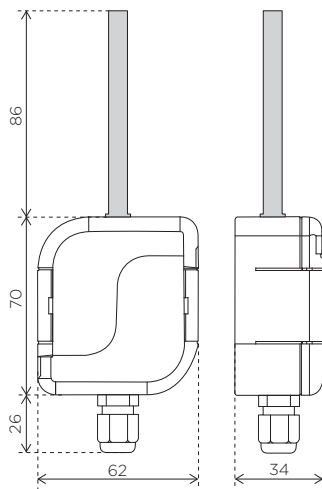
1 Modul



AirIM-100S/M  
AirIM-100L/M

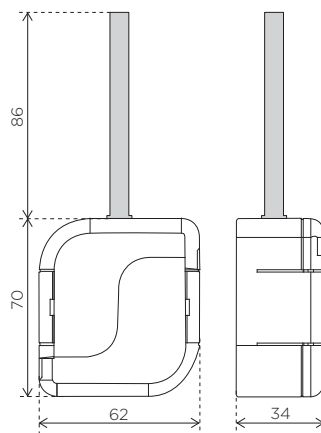
AirDAC-100L/M

IP65



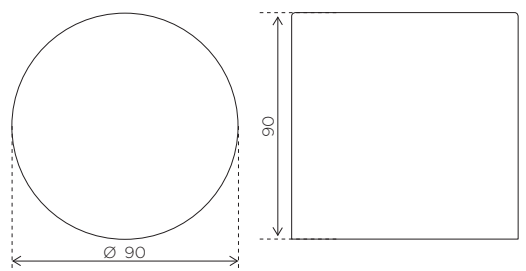
AirIM-100S/L/Nb  
AirSLC-100L/Nb

IP65



AirSOU-100S/L

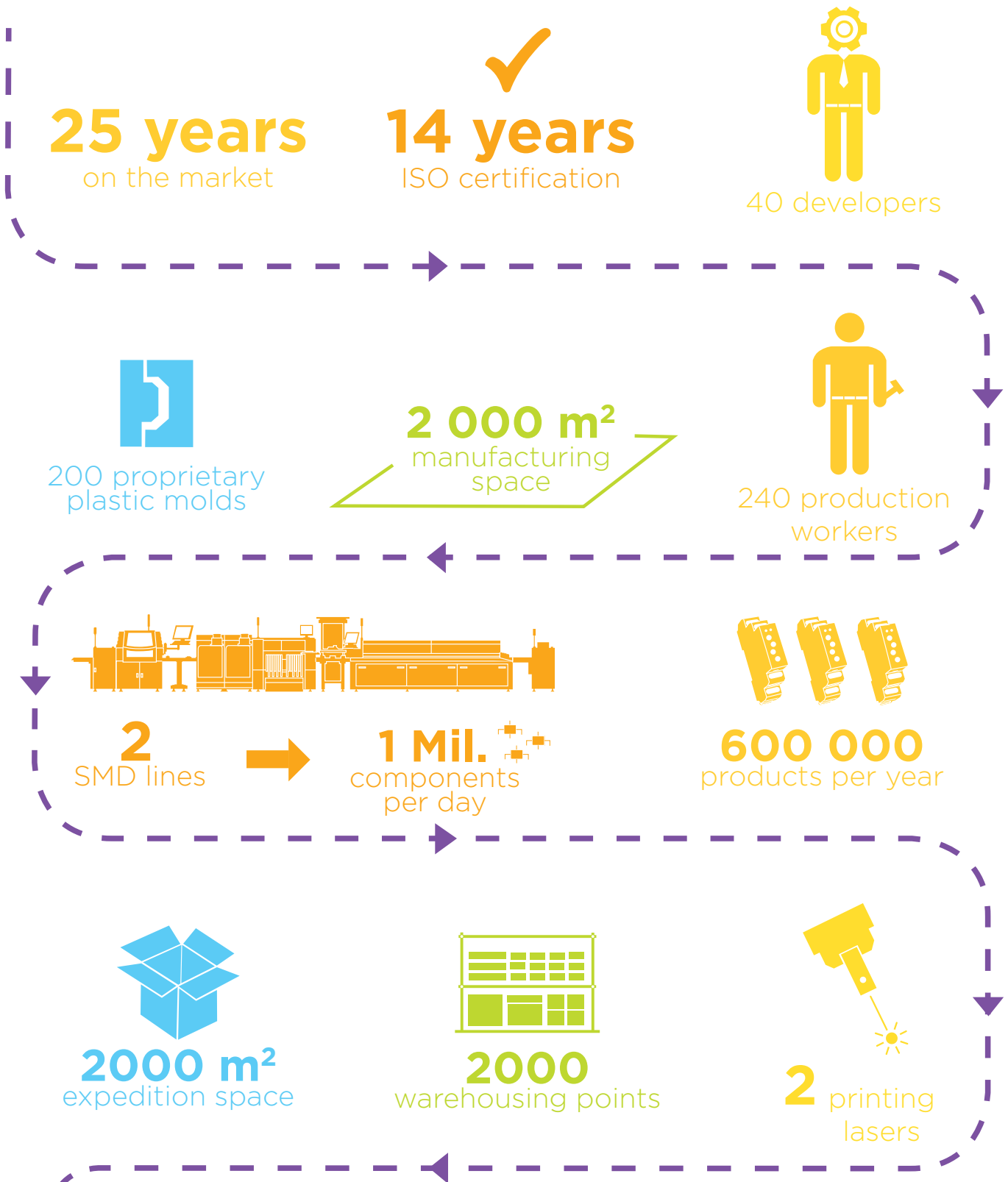
Parking sensor



AirPS-100S

Others just resell

HOWEVER, WE DEVELOP AND MANUFACTURE PRODUCTS OURSELVES!



R&D overall view



Internal lab



SMD production line



Chip placing



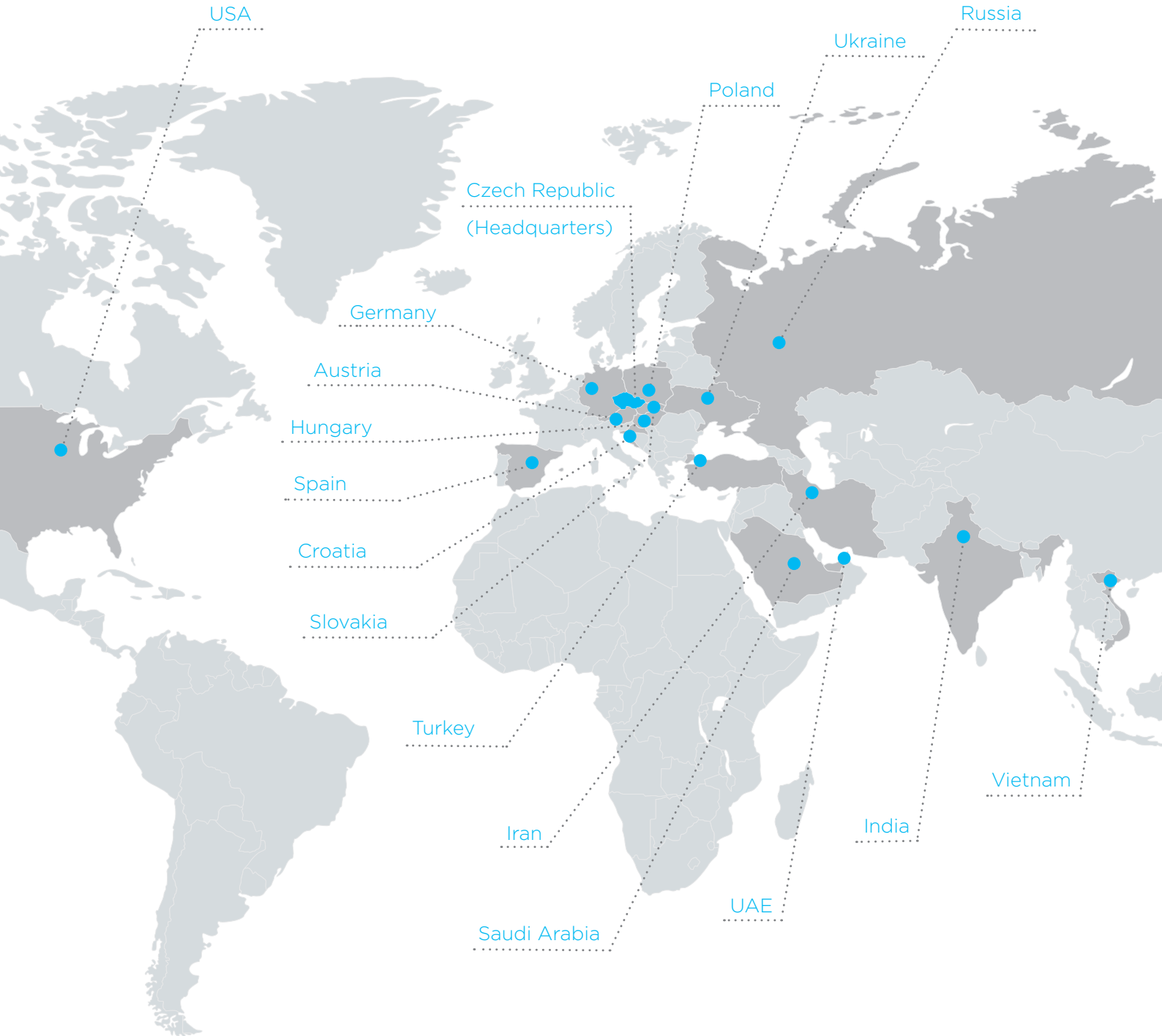
Production hall



Testing



# ELKO EP Holding



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