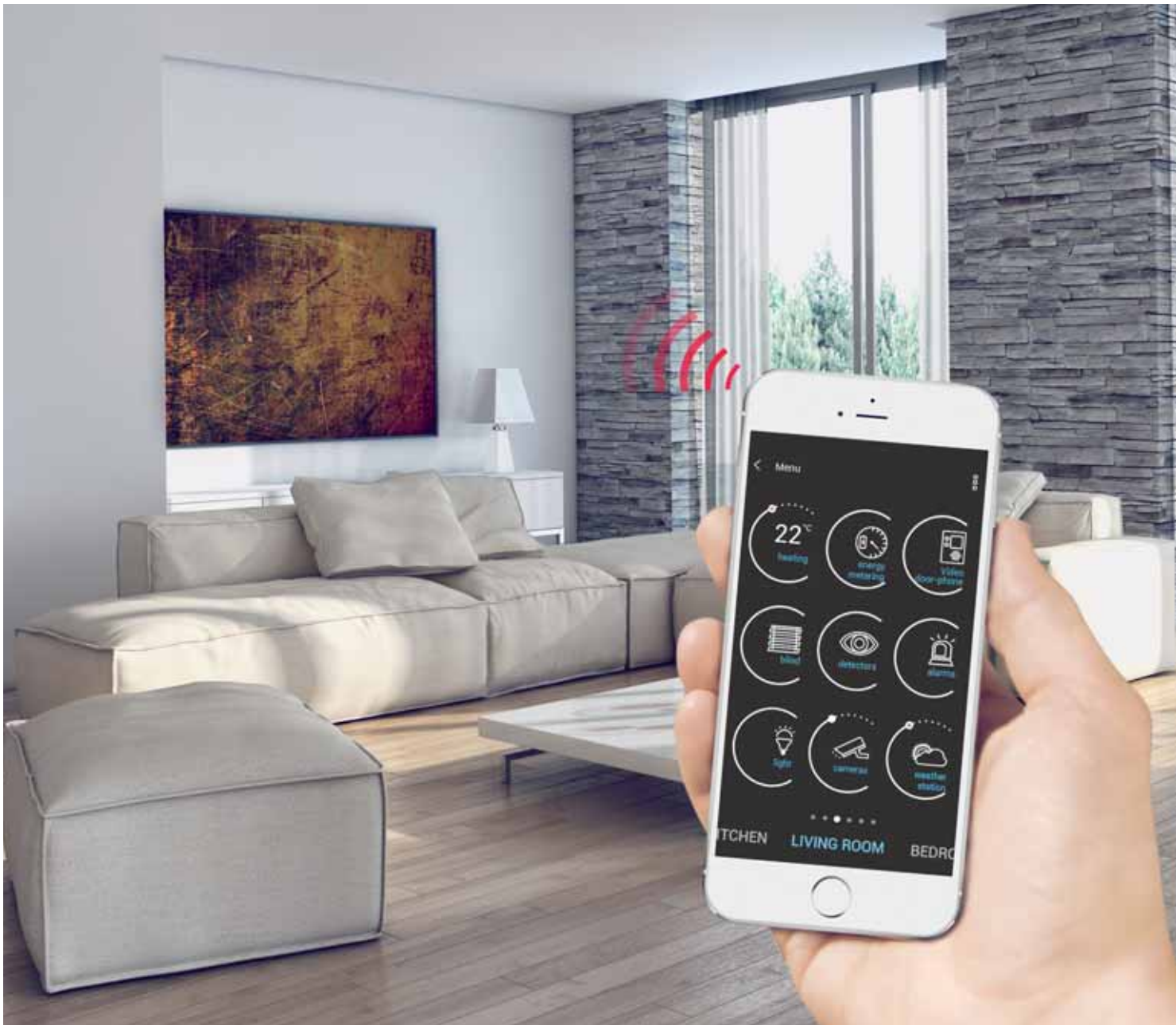


Installation manual

iNELS RF Control



www.elkoep.com

iNELS[®]
RF Control

INTRODUCTION

We are a traditional and innovative manufacturer of electronic devices based in the Czech Republic. We are proud to have been your partners in the field of electrical installations for 23 years. Thanks to years of experience and our participation in the electronics market, we have become specialists in electronic module devices - relays, of which we produce more than 200 types.

Own production, modern apparatus, research and development center - all this allows us to lead the development of the most coveted technology of today, the smart system of electro-installation iNELS. We develop and manufacture products that save energy. The iNELS system is an integral part of passive and low-energy houses.

Product development is inextricably linked with the development of trade, or, conversely, if there were no sales - there would be no products. Year on year increases in sales and business development networks are proof of that. We are always close to our customers - and always ready with technical support and a well-stocked warehouse. You will find our offices in eight European and two Asian countries. In addition, we have de-

pendable customers in more than 66 countries and more are constantly being added as demand is constantly increasing for our products. Our products can be found under the brand names of world (Schneider Electric, Eaton, Hager, Siemens, NIEAF SMITT).

Development and modern technology are the pillars of our work, which in practice is appreciated by you - our customers. You get not only products, but also customized solutions - according to your requirements. Our own development facilities and meticulous production and distribution combines to give you the opportunity to use solutions which are both innovative and practical. We produce all our products in our modern production facilities, which has been expanded by including the latest SMD and fastest production line, which means you are guaranteed quality and flexibility of supply.

The installation manual is intended for system partners/developers as it makes recommendations for installation and a comprehensive introduction to wireless technology, iNELS RF Control.

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1. THE DIFFERENCE BETWEEN WIRED AND WIRELESS INSTALLATIONS

In conventional electrical wiring, cables are routed from the distribution box to the outlets, switches and lights. Using a wireless system, since it is possible to use battery powered switches, the cables leading to the switches are eliminated. Another great advantage are the subsequent functions which are a given for a standard switch. With a wireless switch it is possible to select the functions to switch on/of, time delay the lights and reset or adjust these functions at anytime. An indisputable benefit is the ability to control the selected light circuit from multiple locations or it can be connected with other lighting circuits.

1.1 iNELS RF Control is ideal

Ideal in the use of reconstruction, to which any device can be added. Alternatively, if you want to start living in a smart home, but do not know whether the house will comply with the system. Or when the financial costs incurred in the construction of the house do not allow room for automation with a high initial investment. The big advantage of iNELS RF Control is that you can start with a simple set and expand the system as desired or when finance allows.

1.2 How the iNELS RF Control can control an extensive installation

Generally, firms rush into the installation of multiple components (which are often in their thousands). Experienced system partners (who are engaged in installing wireless systems), say that the building is suitable for installing a max. 40 to 50 components without having to adjust to a complex path of sw, or if the signal is lost, this results in a subsequent relationship issue with reliability.

1.3 Types of communication

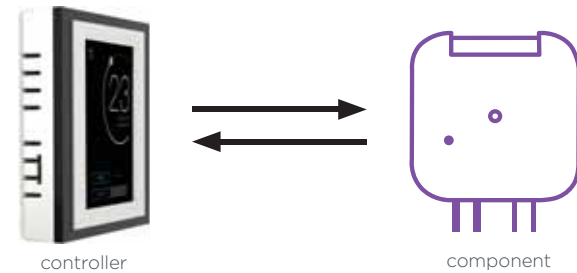
• One Way

The downside is that you do not know whether the message has reached the component or not.



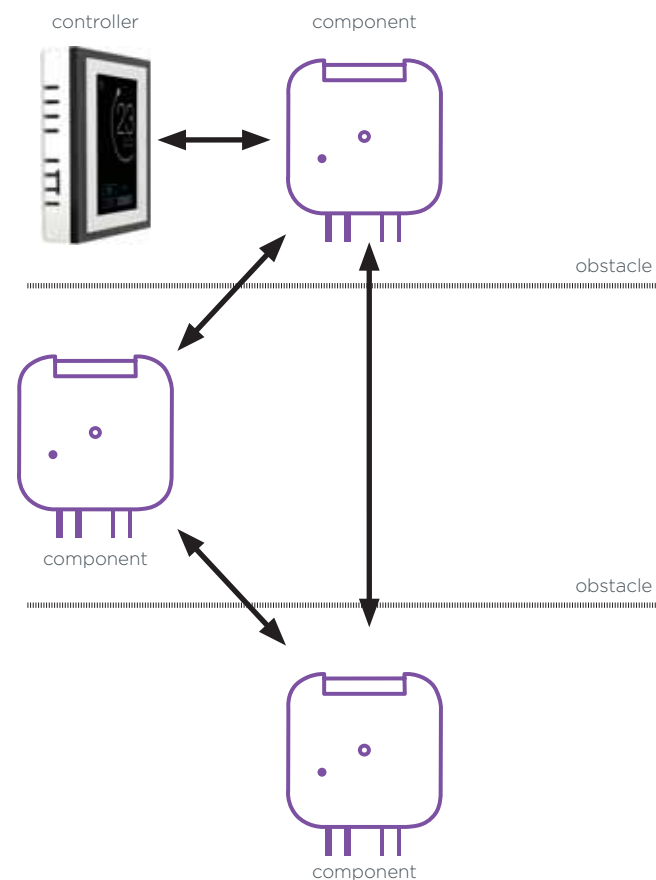
• Bidirectional

For the transmission of data "routing" via components - using a repeater



• Mesh

Sometimes there is a requirement to correct the sw signal path due to delays.



2. GENERAL COMMUNICATION CONTROLS (STANDARD)

2.1 iNELS RF Control - RFIO

RFIO is a proprietary protocol from ELKO EP, which it developed in 2005 and it is constantly improving. Communication is intended not only for simple commands such as switching lights, but also for receiving/transmitting the values of temperature or consumption. The RF module was tested at the Institute of Electronic Communications and items subject to standards FCC, EN 60669, EN 300 220, EN 301 489 R & TTE Directive, Vč.426/2000Sb. The system operates at a frequency band of 868 MHz/916 MHz (for automation), wherein the transmit power of the RF module (integrated in the components) 25 mW. This brings great results applied across the frequency range of installations. Components communicate among themselves bidirectionally and with adjustable routing through other components (each component can be used as a repeater).

Available frequencies in each area:

866 MHz	India	916 MHz	North / South America, Australia
868 MHz	EU, UA, RU, Middle east	922 MHz	New Zealand

2.2 Versions of iNELS RF Control

• 2008-2009

- Components marked RF Control (one-way communication).

• 2009-2014

- Oasis & RF Touch compatible (compatible with Jablotron Oasis 80 detectors system and the RF Touch). The difference between Oasis 80 and RF Touch is a one-way vs. two-way communication.

• 2015-2016

...RF Control components are bidirectional.

• 2016...

....RF Control 2, setting routing through the components.

Individual versions are compatible with each other (except version 2008-2009).

2.3 Advantages of RFID

- the RF module (RFIO) does not tie the customer or system partners to any licenses or other fees associated with the software
- each subsequent version of iNELS since 2009 is compatible with each other
- guaranteed all elements, features between each other to be 100% compatible
- setting communication between the components is not conditional on a computer or Internet connection, the same is true for the actual

operation of the system = works without internet connection

- data is stored in the products, not in the cloud
- if a system partner wants a program within the system itself, we provide an Api for free (As opposed to standard)
- RFIO does not overwhelm space for unassigned commands
- single setup control component and you do not need to set any additional software or programming tool

Command (message) is broadcast five times, during which, if the element responds the first time, the band continues with no unnecessary communication floods. If the command does not arrive even once the whole process is repeated. If re-commanded (which can also be temperature information) is received, specially with temperature, information is transmitted to turn off components.

See. Fig. p. 6 - Functional diagram RFIO

2.4 Frequency 433 vs. 868 MHz

According to the general authorization for the use of radio frequencies for the operation of short range devices for not specified stations The maximum radiated power is limited by law to 10 mW at 433 MHz frequency band and to 25 mW at 868 MHz frequency band.

With the maximum radiated power relating to the distance at which these devices can communicate. 433 MHz band is mostly used for communication solutions for short and medium distances. Up to 50 m or thereabouts. It provides a cheap and easy way to connect two devices. However, this band is very busy and may cause interference with other devices operating at this frequency.

Rules for 868 MHz band are more restrictive than those for the 433 MHz band. The distance over which two devices can communicate is about 200 m, It can be called the mid-size range. Interference with other devices operating in the 868 MHz frequency is thus reduced, providing better quality information transmission.

- Certification iNELS RF Control:

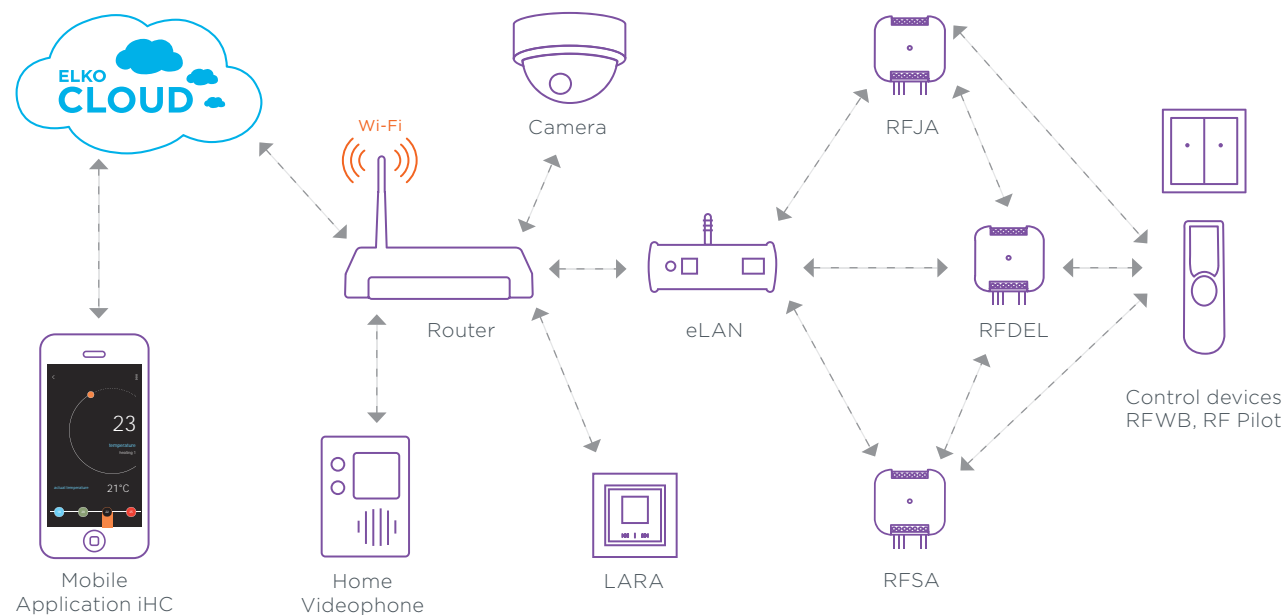


The RF module was tested at the Institute of Electronic Communications and items are subject to standards ČSN EN 60669, EN 300 220, EN 301 489 directive RTTE, NVč.426 / 2000Sb (directive 1999 / ES).



FCC certification is a condition of the sale of wireless system iNELS RF Control for USA. It is a rigorous certification, which confirms that electromagnetic interference (EMC) of the device iNELS RF Control is within the limits approved by the Federal Communications Commission. and Examination and obtaining certification without any problems is proof of the quality of the entire system. In the production of the products iNELS RF Controls undergo double final inspection before leaving the headquarters of the firm.

Functional diagram RFIO



3. BASIS OF HIGH QUALITY INSTALLATION FOR A SATISFIED CUSTOMER

The first step to a successful installation is filling the check list, where your customer marks, „what he wants to dominate,“ then „as a means to control“ and then calculated by the partner using the software tools to easily tailor the offer.

- offer (in the form of an iNELS checklist)



- subsequent calculation program for calculating the quote (supplied free)
- installation according to manufacturer's recommendations
- service

grams are as they were, it runs, starts and re-starts
5. What if the battery control runs out of power?
 The system indicates low battery, you simply replace the battery. These are common types of batteries, available in every watchmaking and Appliance Store.
6. Do I Need Smart Home?
 No, you do not need, but you do not need a car, a washing machine, smart telephone and many other technologies. However, it's a lifestyle.
7. Will I save?
 Definitely yes, it can save up to 30% on heating costs with regulation; depending on whether or not you are at home. More savings from switching the boiler to run only at a time when energy is cheap (TOR. HDO).
8. I can handle the control system?
 If you have a smart phone or know how to flick a switch firmly Yes, the whole operation is adjustable according to your wishes.
9. What if my grandma comes to stay Will she be able to light up?
 The smart system can be combined with the existing electrical wiring.

3.1 What to avoid in the installation

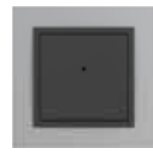
- beta testing with customers
- giving up with a problem in the work
- do not say that the system is perfect and never goes wrong
- do not just take big orders, even a small job makes for significant marketing

3.2 The biggest myths about smart homes

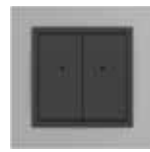
- 1. Installation is expensive.**
You can start from 48 EUR.
- 2. Harmful to health.**
If we take into account that you do not have a microwave at home and not using a cell phone (or cordless doorbell) yes.
- 3. Someone could hack into my house operation.**
Impossible. If you do not disclose your access data to third parties.
- 4. What if the electricity fails?**
You can have a backup power source in the form of a battery. And when it does fail...nothing. Once the electricity is switched on, the system checks its self. All preset pro-

3.3 What components iNELS RF Control offers

Controllers



RFWB-20/G
2-button wireless wall controller



RFWB-40/G
4-button wireless wall controller



RF Key
4-button controller - key-chain



RF Pilot
Wireless remote control with display



RFIM-20B
Wireless contact converter (2 outputs)



RFIM-40B
Wireless contact converter (4 outputs)



RFSG-1M
Wireless contact converter

System Units



RF Touch-B
Wireless touch unit - Flush mounting



RF Touch-W
Wireless touch unit - Surface Mounting



eLAN-RF-003
Smart RF box



eLAN-RF-Wi-003
Smart RF box with Wi-Fi



RFGSM-220M
Multifunction GSM communicator



RFRP-20
Signal repeater



RFPM-2M
Energy gateway

Switches



RFSA-11B
Wireless switch unit (single function) - 1 output



RFSA-61B
Wireless switch unit (multi function) - 1 output



RFSA-62B
Wireless switch unit (inbuilt) - 2 outputs



RFSAI-61B
Wireless switch unit with input for a pushbutton



RFSA-61M
Wireless switch unit - 1 output



RFSA-66M
Wireless switch unit - 6 output



RFSC-61
Switching socket (multi-function)



RFUS-61
Switch unit for outdoor use (multi-function)



RFJA-12B/230V
Switch unit for shutters



RFJA-12B/24V DC
Switch unit for shutters (Contact-less)

Dimmers



RFDA-73M/RGB
Dimmer for color (RGB) LED strip



RFDSC-71
Dimmer socket (multinational)



RFDAC-71B
Analog regulator 0 (1) -10V



RFDEL-71B
Universal dimmer (recessed)



RFDEL-71M
Universal dimmer (Modular)

Lighting



RFSOU-1
Wireless twilight switch



RF-RGB-LED-550
Wireless colour bulb



RF-White-LED-675
Wireless white bulb

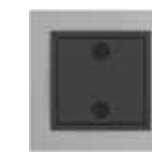
Temperature Regulation



RFATV-1
Wireless thermostat



RFSTI-11B
Switch unit with temperature sensor (flush mounted)



RFSTI-11/G
Switch unit with a temperature sensor and breaker



RFTI-10B
Wireless temperature sensor



RFTC-10/G
Simple wireless temperature controller



RFTC-50/G
Wireless temperature controller



RFTC-100/G
Wireless temperature controller

Monitoring Units



RFSF-1B
Wireless flood detector



RFTM-1
Wireless pulse converter

Cameras



iNELS Cam
IP camera



Supported cameras

Detectors



RFSD-100/SD-100
Smoke detector wireless/wired



RFMD-100/MD-100
Motion detector wireless/wired



RFWD-100/WD-100
Door/Window detector wireless/wired

Accessories



FP-1
Flood probe



TC/TZ
Temperature sensor



AN-I
Internal antenna



AN-E
External antenna



Telva
Thermocouple



CT50
Current transformer



LS, MS, IRS
LED sensor, Magnetic sensor, Infrared sensor

3.4 How to read the type designation

In the iNELS RF Control product range every component has a type designation from which you can determine its functions, assembly and outputs.



- R Radio
- F Frequency
- S Switching
- A Actuator
-
- 6 function
- 2 outputs (channels)
- B box

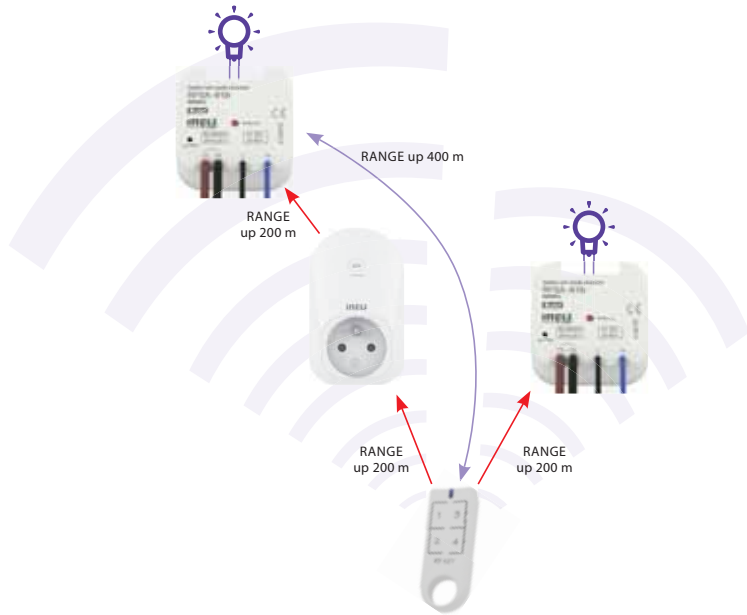


- R Radio
- F Frequency
- D Dimming
- A Actuator
-
- 7 function
- 3 outputs (channels)
- M modul

3.5 Installation

Location of the components depends on the distance between the controller (the system unit) and the component, the material through which the signal passes plays an important role in component placement.

Range in an open area is 200 m, but this figure is only an approximation for real installation orientations.



Therefore, it is important to proceed according to the following points, to ensure the best possible visibility of the controller (system unit) and the component. Transmission in a brick building through 5 walls (width 20 cm) is in the order of 40 m. Conversely when you install elements, the minimum distance between components should be at least 1 cm.

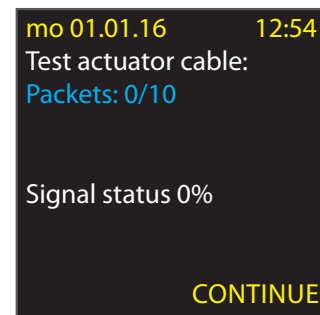
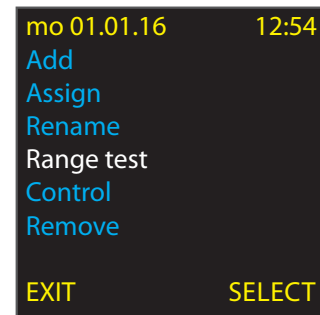
Transmission of radio frequency signals in various building materials:

60-90%	80-95%	20-60%
brick wall	wooden construction with drywall boards	reinforced concrete
0-10%	80-95%	
metal partitions	ordinary glass	

Before installing, it is necessary to measure the signal quality between the individual components. This procedure is often underestimated, but it is an important first step towards the installation.

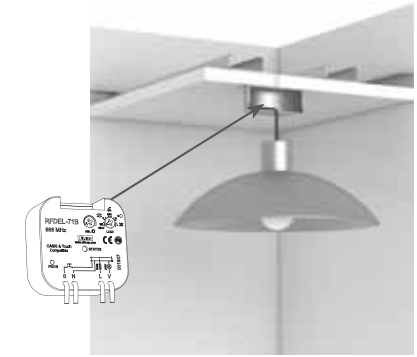
Measurements can be made using the control touch unit RF Touch or remote RF Pilot (which have the range test function). It is recommended to use the RF test pilot for this, because it is a flexible controller and battery-powered. The component is placed at the installation site and the aforementioned control tests the signal quality.

Order of magnitude, if you get below 30% signal quality, it is necessary to relocate the component to maintain 100% functional.

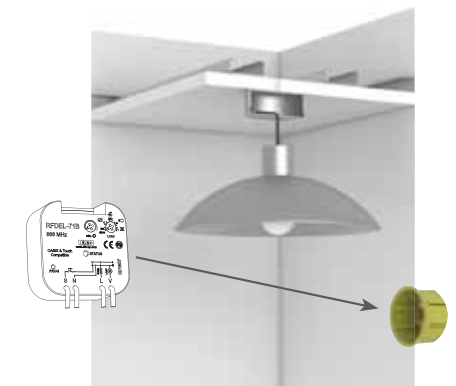


3.5.1 Where to install devices

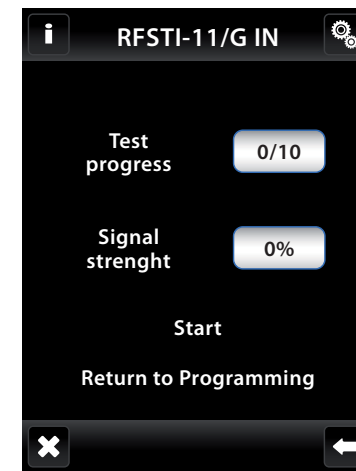
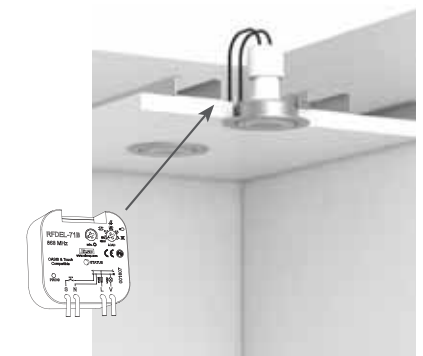
The ideal place for mounting components is in direct line of sight of the iNELS RF Control (eg. light fittings). Because it is located in the center of the room and has direct visibility to the controller (if there is a system controller).



Another fitting space is in an installation box, where, thanks to the size, wireless devices fit seamlessly (such as a high volume installation boxe.g. KU-68). Tip: the space in the installation box is particularly suitable if you want to keep the existing control button and combine it with wireless - this can be done with components RFSA-61B, 71B-RFDEL.



It is convenient to mount components in ceilings, which offers plenty of space. Tip: Each dimmer produces heat which has to be dissipated, when mounted in the ceiling this is resolved, because there is generally more space.



Another way to check the communication range (of the system components) of the installation is using the RF Tester (battery powered) and USB fob RFAF, which is connected to the PC. The principle of the test is the location of the system component to the installation site (e.g. ELAN).

PC should be placed close the system unit and open the software with RF scanner (do not forget to connect the RFAF to the USB).

Subsequently you go through the RF TESTER with the components to be installed in places where they will be installed. On the PC, you can see the quality of the signal. When it is less than 30% it is better to relocate the component.

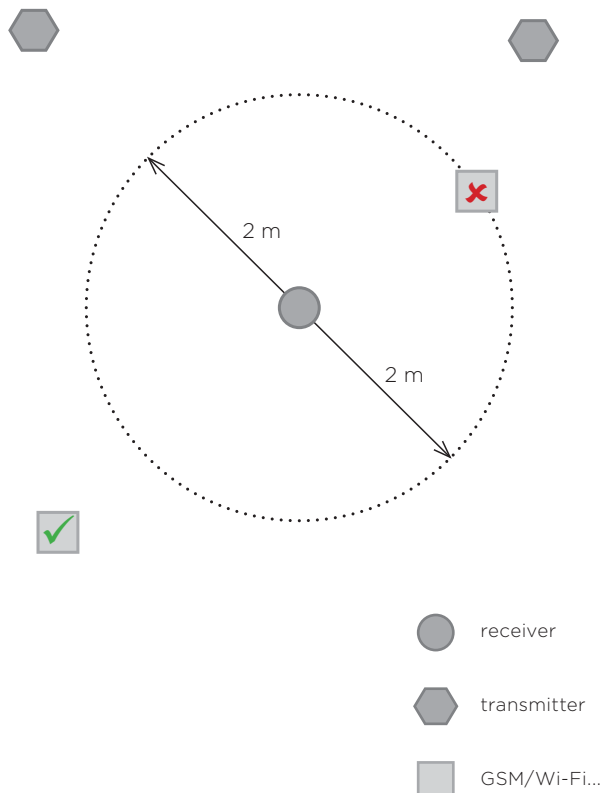
3.5.2 What can interfere with RF communication?

If the signal is weak there can be a source of interference called. router interference = If there are several Wi-Fi networks, and they are installed near the transformer station, which produces EMC. Disruptive influences can be caused by a non-certified wireless doorbell, but also from the microwave (especially at a frequency of 433 MHz). In practice it may happen that seemingly permeable material such as glass, becomes impermeable and especially in cases where aluminum foil it is installed on the glass.

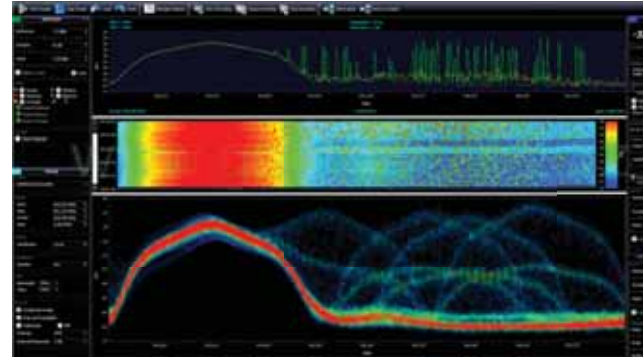
Wall material can be made of anything, and sometimes it's hard to figure out what it is. The biggest loss (of signal) is delivered by building reinforcement girders, Steel casings and steel within the walls of industrial buildings. Here you can use a commercially available metal detector to install a wireless system. The result of such an installation reflect electromagnetic waves, like that of a mirrored surface that reflects light and so creates an electromagnetic shadow. For small objects such as bolts, nuts, screws, nails, this phenomenon can be omitted. It is necessary to take into account that components or the system controller installed directly into the wall box (which is in the vicinity of electrical cables) can bring about a loss of signal strength up to 30%. The same is true when installed on metal surfaces.

Distances from other sources of interference

The respective distance of components or the system unit from other transmitters, sources of interference (eg. GSM device/Wi-Fi/ weather stations, etc.) should be at least 1.5 meters.



How can you identify the interference or signal source? The type device which scans the area is called a spectrum analyzer.



3.6 Power

The power of our controllers, components and system units is 230 V AC (50 Hz), 110-230 V AC (50 Hz), 120 V AC (60 Hz) - US 12-24 V AC/DC and battery CR2032 AA or AAA batteries. The components are powered by mains voltage with a power tolerance of + 10% - 15%.

Perhaps the greatest challenge for the customer is the life of the battery. On the market there are controllers with piezoelectric power (especially EnOcean) to function they do not need any other power, but the disadvantage is a ridged handshake and significantly higher noise levels. Battery replacement is quite simple.

Weak batteries have charge level components that signal the low level, this is indicated on the application or the touch control unit RF Touch. Replacing the batteries in the remote control comes without lose of the set programs, they are stored in memory.

Generally, temperature influences battery performance. Temperature instability can significantly reduce the reliability of backup batteries and to some extent complicates the stable operation of the battery. Batteries reach nominal characteristics at temperatures around 20 °C and higher temperatures leads to shortened service life and frequent battery exchanges. For example, if the ambient environment temperature is persistently higher by only about 5 °C it can shortened service life by about 25 to 30 %.

Installation of the components to the distributor is a given and must be suitable for the switching of sock-



ets or lighting circuits. Here you should avoid enclosing components in metal, as iron does not allow signals to be received and creates a Faraday cage. Tightening torque of the terminals (distributor components) is a standard 0.4 Nm.

If the component must be placed in a metal cabinet, it is necessary to use an external antenna. Tightening torque of the antenna is 0.56 Nm.



External Antenna AN-E

In the event that the components are install next to each other, they must have a gap of at least 1 cm between them. If circumstances do not allow this distance to be observed A metal foil is used to separate the components in the broadcast signal.

This design of component provides switching and dimming features and the socket is installed directly to an existing outlet (French, British, US design).

The design elements of the IP65 means that the product (electronic part) is protected against accidental contact with any tool (dust proof) and protected against water ingress. Water through a 6.3 mm nozzle at all angles at a flow rate of 12.5 liters per minute at a pressure of 30 kN/m² for at least three minutes from a distance of 3 m. They are installed in garages, garden houses, cellars, greenhouses,...

3.7 Installation/placement of controllers and system components

RFWB-20/40 wireless switches it is possible thanks to the flat base to mount on an existing installation box or stick to practically any material, even on glass.

The RF Touch system controller is offered with a wall box mounting (in case of 230 V). It is possible to attach to the wall by means of adhesive (with power adapter).

For Smart boxes eLAN installation is arbitrary, but for best results they are mounted farther away from disturbing elements, such as routers, servers, rack,...

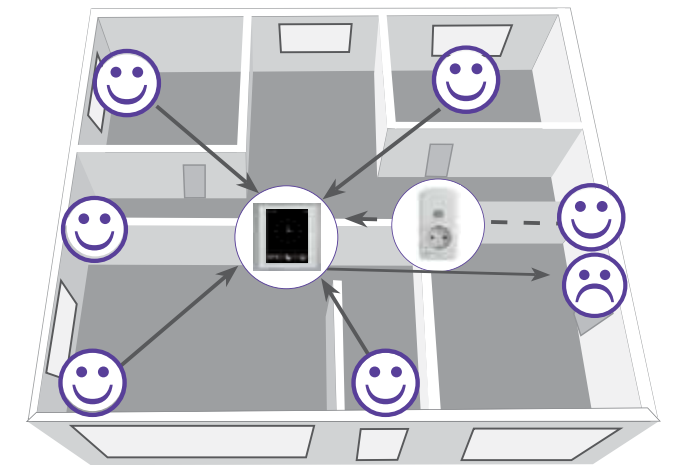
RFIM-20/40 wireless transmitters are installed in an existing installation box under switch/button technology, from where they transmit a signal.

Between the controller and the component there must not be a distance of less than 1 cm.

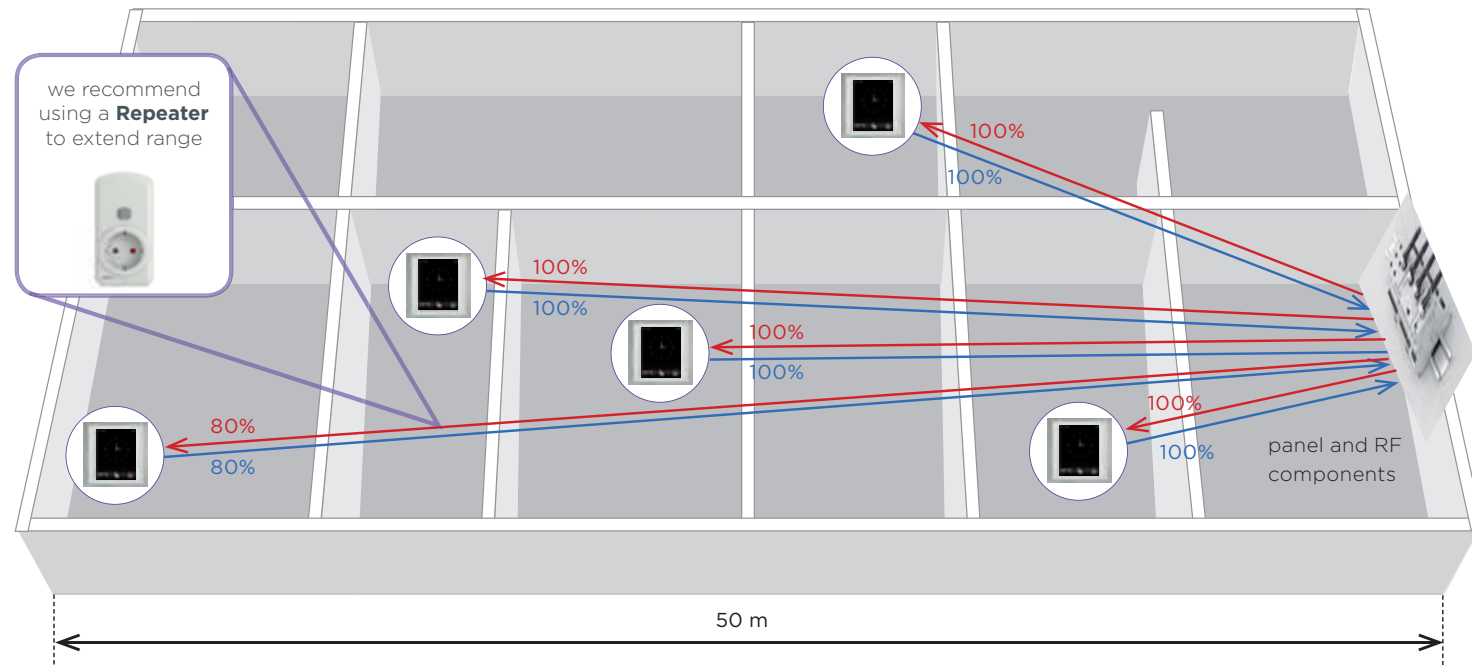
Basically you should place controllers such as the wireless switch RFWB with the best possible visibility to the component, you must ensure that the signal does not pass through walls diagonally.

Between the controller and the component there must not be a distance of less than 1 cm.

System controllers are installed with the best possible access to all the components, usually in the middle of the house or room where the components are.

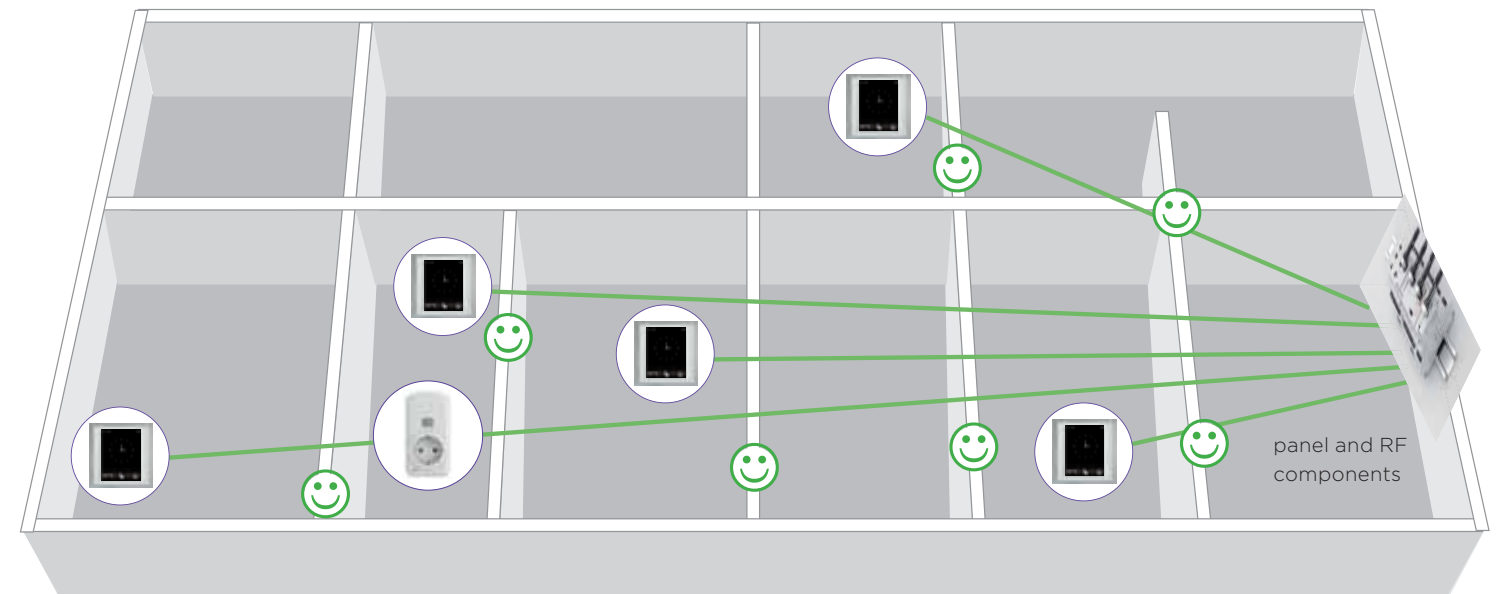


A real example of the range of RF Touch in a house where it was set to command „Scenes“ for switching 20 components The first house is built of bricks, the depth of the wall is about 20 cm.



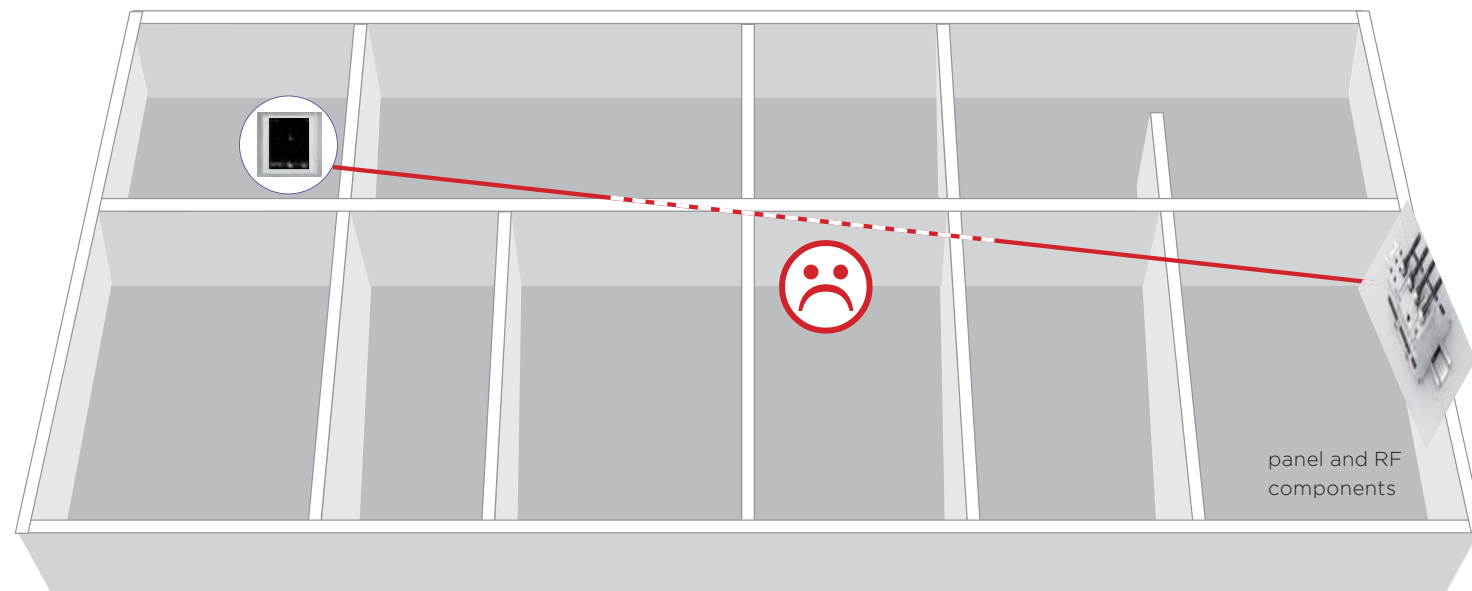
What is the optimal signal passage?

When the signal passes (between the controller and the component) directly through the material.



To determine which component placement to avoid?

Diagonally, the signal passes through the material thereby increasing the risk of wireless failure.



4.2 Dimming components

For dimmers in general, the output vs. maximum load should not be more than 70%.

Furthermore, dimmer cooling is a valid concern therefore do not install dimmers next to each other or with another source of heat (or contact, whose switching produces EMC and thereby may affect the correct operation). For all ELKO EP dimmers there is an integrated thermal fuse, which at elevated temperatures above 82 °C deactivates the output of the dimmers (indicated by a blinking LED), while activated the dimmer cannot of course be controlled. After cooling itself, dimmer control is again possible. It is advisable to move dimmer, to prevent recurrence.

To eliminate noise interference of switching contacts (and thanks to the electronic switching) dimmers can also be used for switching smaller loads such as fans.

One of the great advantages of iNELS RF Control is a range of universal dimmers with the marking RFDEL and connection of existing keys on installing terminal „S“. Their versatility is performed by setting the light source R, L, C, LED, ESL and also the possibility to set

the minimum luminance value - this (especially for LED light sources) eliminates flicker during dimming. Load light source (circuit) in the case of the classic resistive load can be calculated easily, however, with the LED light source, the issue is greater.

A common issue in this context is how many LED light sources can be connected to the dimmer?? Did you know that even though the manufacturer indicates the load parameters of the dimmer, you have not yet won? Why?

Each dimmer has overload protection which reacts at a certain peak current value. Each load (incandescent, LED, energy-saving lamps) has some power. The manufacturer usually indicates this on the package. But there is no specified peak current value of the load. And because each LED or energy-saving lamp has some electronics inside, the peak current values for different products can vary widely. For this reason, you can not generally determine the number of individual LED bulbs, so you cannot know this value. Outside of testing a specific number of pieces. We have tested the dimmer for you.

Check out the following summary table of the lamps load capacity:

Load capacity light sources	LED bulbs		LED spotlights			LED panels		LED/RGB strips					
	DLB-E27-806-2K7	DLB-E27-806-5K	DLSL-GU10-350-3K	LSL-GU10-350-3K	LSL-GU10-350-5K	LP-6060-3K	LP-6060-6K	LED strip 7.2W	LED strip 14.4W	LED strip 19.2W	LED strip 28.8W	RGB strip 7.2W	RGB strip 14.4W
	quantity	quantity	quantity	quantity	quantity	quantity	quantity	quantity	quantity	quantity	quantity	quantity	quantity
RFDCS-71	21	✓ 21	✓ 45	✓ 25	-	-	-	-	-	-	-	-	-
RFDEL-71B	11	✓ 11	✓ 25	✓ 13	✓ 13	-	-	-	-	-	-	-	-
RFDA-73M/RGB	-	-	-	-	-	-	-	✓ 3x8 m	✓ 3x4 m	✓ 3x5 m	✓ 3x4 m	✓ 20 m	✓ 10 m
RFDAC-71B	-	-	-	-	-	✓ 50	✓ 50	-	-	-	-	-	-



More on dimmers in the dimming brochure:
<http://www.elkoep.cz/reseni/stmivani-svetel/>
<http://www.elkoep.cz/ke-stazeni/rele/brozury/>

How to determine the maximum connectible lamps:
 Power factor of dimmable LEDs and ESL bulbs ranges $\cos = 0.95$ to 0.4 . The approximate value of maximum load you get by multiplying the load capacity of the dimmer by the power factor of the connected light source.

If you do not know the above, we recommend the use of lights from ELKO lighting sources, which of course we have tested.

4.3 Temperature components

The following information is particularly important for Thermal components.

The thermal component sends the measured temperature value to the system controller at regular 5 minute intervals. If there is a sudden temperature change it can send it within 1 minute. Sudden changes in temperature means a decrease/increase in the temperature by 3 °C since the last transmitted value. However, if the temperature change is of less than 3 °C the component send the information to the system controller at the next 5 min regular interval.

Another reason for this is that if the household power supply operates on a two tariffs (D25d) and after switching on the heating element will begin to heat during the more expensive tariff. In case of a situation where the heating element loses communication with the system, as part of the its security function it turns itself off.

Safety features of thermal components:

RFSA-6x RFSTI-11B or G, these components can be assigned for the switching of heating.

RFSA-6x is controlled by the Smart RF box (eLAN-RF) using a delayed shutdown with a time of 5 minutes. This means that if eLAN has ceased communicating (e.g. Loss of power) the relays are always safely off. The Smart RF box eLAN-RF regulates temperature and responds whenever the status changes (temperature change, regime change) and the relay turns off/on according to the current requirement. In case that the message is not received by the RF component (crosstalk, interference, loss of power supply units) The eLAN command is repeated every two minutes.

RFSTI-11B/G has within its self a secure autonomous OFF only with eLAN an ON or OFF. If communication is lost, The relay switches itself off in 5 minutes and the LEDs on the panel start flashing in red. The component its self at intervals of about five minutes sends the measured temperature to the eLAN and checks that it matches feedback report. The component evaluates as valid and communicates this. The relay will stay on. The relays safety functions thus, responding to commands on/off, but also to the temperature.

After successful installation, the wireless RFATV-1 thermo value takes 3 minutes to adapt (this is the time it takes to open and close the valve). Wireless thermo valve RFATV-1 has software installed that adapts to the environment, direction and speed of the increase/decrease in temperature over the next 14 days (operation is not affected). The benefit is an effective control method, which allows the valve to react to temperature changes proportionally.

In the event of pulling out the batteries of wireless RFATV-1 valve (if you had an offset temperature) This should be set again in iHC-MARF/MIRF. What happens after a power failure of the system unit (ELAN-RF ...) in the case functionality with the wireless thermal head RFATV -1?

In the event that the final desired temperature was greater than 21 ° C, then the wireless thermal head RFATV -1 will autonomous heat to 21 ° C. When the last required temperature was less than 21 ° C, then RFATV-1 will autonomous heat to the last set temperature.

When changing the water pressure in the heating circuit (water filling during maintenance) re-calibrate the RFATV-1 according to the instructions to ensure proper process functionality.

In general, with all temperature components you can adjust the system controller or application:

Function:
HEATING/COOLING

OFFSET: The adjustable temperature correction of the measured element (which is affected by mounting in an installation box or a switching temperature relay, which produces heat) vs real.

HYSTERESIS: A delay in response to regulatory intervention: eg. When the valve shuts off the hot water in the radiator, the room temperature will continue to rise because the radiator is full of hot water. Conversely, when although the valve is open, temperature decreases, as it will take a long time before the radiator is filled with hot water.

The length of the external temperature component sensor can be 10 cm, 3 m, 6 m, 12 m, however, it can be extended with a cable up to 30m max. Cross-section 2 x 2.25. It is not recommended to run in parallel with power lines.

When installing a wireless thermo valve, these adaptors that are compatible with valves are included:

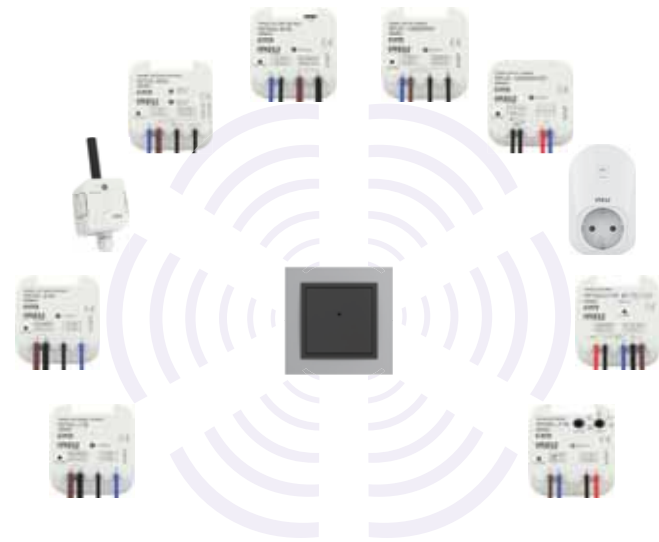
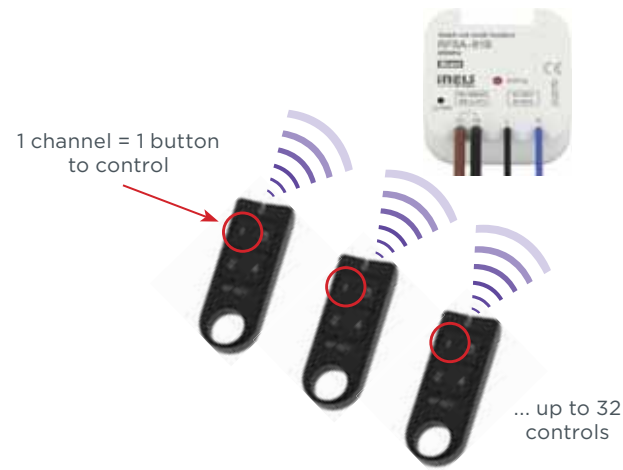


5. SET DESIGN ELEMENTS WITH CONTROLLERS AND SYSTEM UNITS

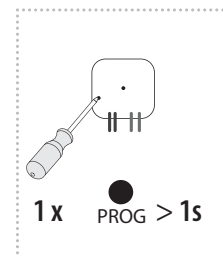
The entire setup can be divided into three levels:

1. Assignment of transmitter controls

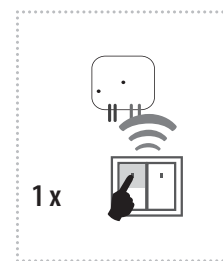
Each switching, dimming, shutter component can be controlled by a 32 channel controller (RF Key, RFWB-20/40 RFIM-20/40 RFSG-1M). When one channel represents a single button on the remote control.



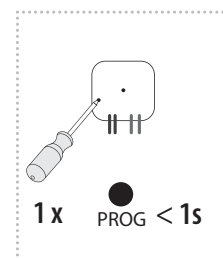
How to do it:



- depress the programming button for less than 1 sec using an appropriate tool to access the programming mode



- after, by a number of presses as indicated on the controller, set the component function



- again depressing the programming button for less than 1 sec to save the function settings

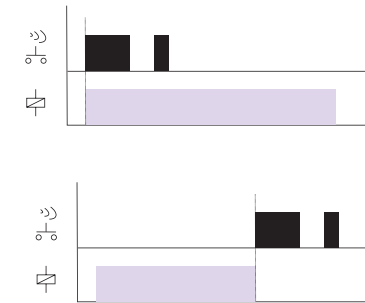


Conversely, one channel controller can switch 10 components. This is used to command the scene. The deployment of components or unit is very important, if you use a fob (which is portable), as the command may not arrive at any of components and the features of the scenes are not executed. Therefore, we would rather recommend the use of a wireless switch such as the RFWB a stable placed controller with perfectly visibility to the components.

Function: Switching component

Single function

RFSA-11B

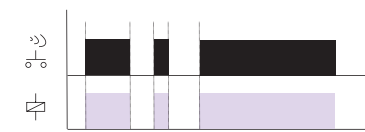


Function - Switch ON/OFF

The output contact is closed by pressing one button position, and is opened by pressing the other button position.

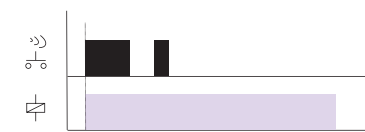
Multifunction

RFSA-61B, RFSA-62B, RFSAI-61B, RFSA-61M, RFSA-66M, RFSC-61, RFUS-61



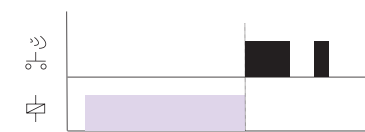
Function 1 - Button

The output contact is closed by pressing the button and opened by releasing the button.



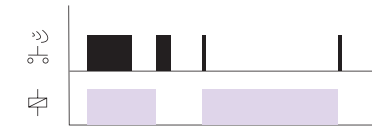
Function 2 - Switch on

The output contact is closed by pressing the button.



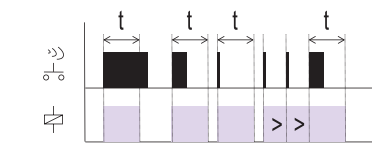
Function 3 - Switch off

The output contact is opened by pressing the button.



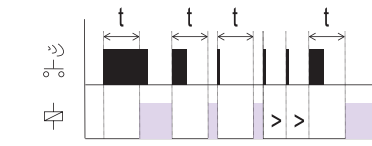
Function 4 - Impulse relay

The output contact is switched to the opposite position by each press of the button. If the contact was closed, it will be opened and vice versa.



Function 5 - Switch off delayed

The output contact is closed by pressing the button and opened after the set time interval has elapsed. $t = 2\text{ s} \dots 60\text{ min}$.

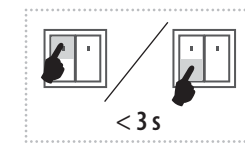


Function 6 - Delay

The output contact is opened by pressing the button and closed after the set time interval has elapsed. $t = 2\text{ s} \dots 60\text{ min}$.

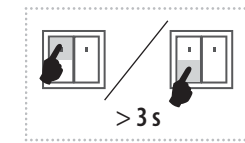
Function - Shutter component

RFJA-12B



Function description

Closing slats, short stroke, less than 3 s.

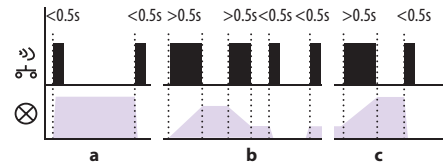


Function description

Shutters retract/extend to end position, long stroke, more than 3 s.

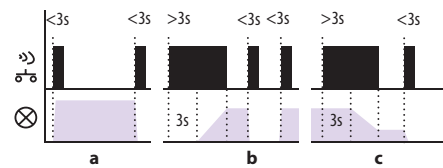
Function: Dimming component

Multifunction



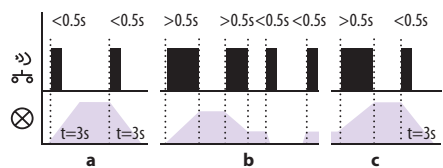
Function lighting scene 1

- a) Press the programmed button for less than 0.5 seconds to switch on light, press again, it goes out.
- b) Press the programmed button for longer than 0.5 seconds to adjust brightness. After the button is released, light intensity is stored in memory and further short pressings switch on/off the light at this intensity.
- c) It is possible to change the intensity at any time, to readjust long press the programmed buttons. The component remembers the set brightness levels even after the power is turned off.



Function lighting scene 2

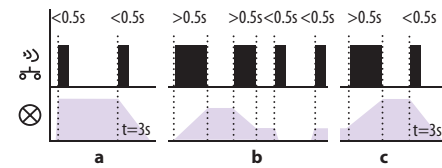
- a) Press the programmed button less than 3 seconds the light goes on, press again it goes out.
- b) To avoid undesirable brightness adjustment. To adjust brightness press the programmed button for more than 3 seconds. When you release the button, the brightness level is stored in memory and further short pressings switch on/off the light to this intensity.
- c) To avoid undesirable brightness adjustment. To adjust brightness press the programmed button for more than 3 seconds. When you release the button, the brightness level is stored in memory and further short pressings switch on/off the light at this intensity.



Function lighting scene 3

- a) Press the programmed button for less than 0.5 seconds to light continuously, it illuminates after 3 seconds (at 100% brightness) continuously. Another short press and the light will switch off in 3 seconds.

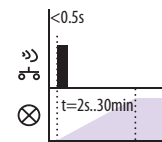
- b) Press the programmed button for longer than 0.5 seconds to adjust brightness. After the button is released, light intensity is stored in memory and further short pressings switch on/off the light at this intensity.
- c) The brightness may be adjusted at any time by pressing the programmed component button. The set brightness levels are remembered even after the power is turned off.



Function lighting scene 4

- a) Press the programmed button for less than 0.5 seconds to switch on the light. Another short press of the button and the light will switch off after 3 seconds (at 100% brightness).
- b) Press programmed button for longer than 0.5 seconds to adjust brightness. After the button is released, light intensity is stored in memory and further short pressings switch on/off the light at this intensity.
- c) Brightness may be adjusted at any time by pressing the programmed button.

The component remembers the set brightness levels even after the power is turned off.

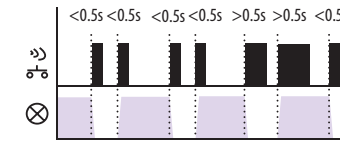
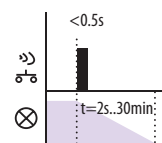


Function Sunrise

After pressing programmed button on the RF remote control lighting will light up for a set period of time ranging from 2 seconds to 30 minutes.

Function Sun Set

After pressing the programmed button on the RF remote control the light starts dimming for a set period of time ranging from 2 seconds to 30 minutes.



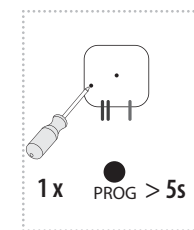
Time setting

In function of the switching components 5 and 6 with dimmer function components sunrise / sunset.

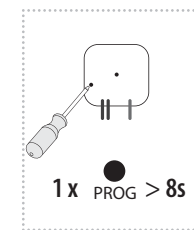
Function ON/OFF

If the light is off, pressing the programmed button activates it. If the light is on, pressing the programmed button deactivates it.

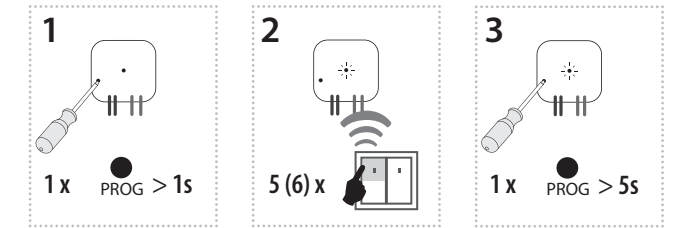
To Delete



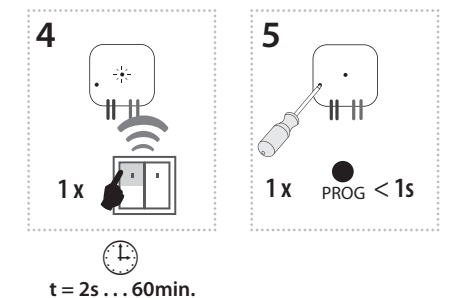
If you want to delete an component from one channel of the controller, depress the button on the controller (from baseline) for 5 seconds, followed by a short press of the select button on the controller.



If you want to erase the component completely from the memory of all controller channels, depress the programming button for 8 seconds (until double flashing LED disappears), then short press programming button to confirm.



1. Press the programming button for 1 second on a component; it is put into programming mode. LED is flashing at one second intervals.
2. The desired function assignment is carried out 5 (6) - By pressing the selected button on the remote control RF (delay between pressing must be 1s).
3. Press the programming button for longer than 5 seconds, indicating component into timing mode. 2x LED flashes at one second intervals. After releasing the button starts accumulating time.



4. After setting the desired time (ranging 2s ... 60min) the timer operation is finished by pressing the button on the RF remote control, which is assigned to a function. This set time interval is stored in the memory element.
5. Programming terminated by pressing the programming button on the element, for less than 1 second (LED turns off).

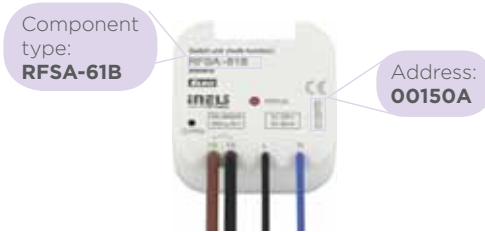
2. Assigning a system component

Another system feature to understand - touch control unit RF Touch, remote control with an OLED display RF Pilot, smart RF box eLAN-RF or GSM gateway RF-GSM-220M.

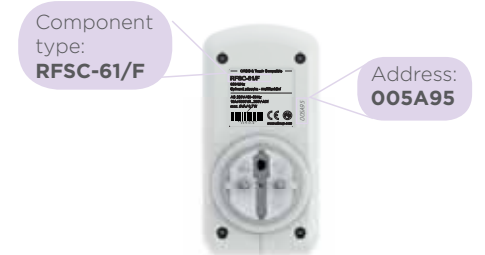
Each component is etched with a tvz. address (6-digit unique code).

Be sure to use the installation manual, which presents a list of the installation components It is part of the RF Pilot and RF Touch manual.

box



socket



thermo-valve



module

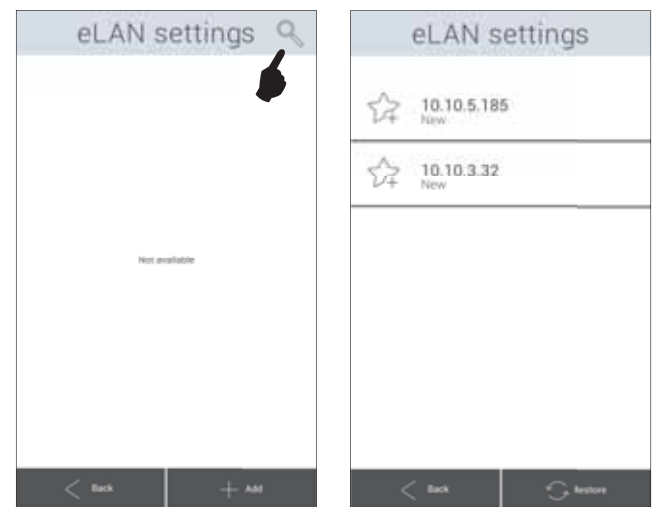


To add this address to the system controller assignment It is not necessary to do any operation with the element.

Smart Box eLAN-RF can be set through your iOS or Android but also via a web interface, which is used mainly for system partners. This environment allows you to download the project to the PC or uploaded to eLAN.

- Maximum load of the eLAN-RF system unit
- Max number of actuators - 40 (maximum of 70 (not counting the heating circuits))
 - Max number of timetables for actuators - 10
 - Max number of timetables for heating - 16
 - Max number of actuators in one timetable - 10
 - Max number of intervals in one time schedule - 8
 - Max number of heating circuits - 16
 - Max number of actors in the heating system - 10
 - Max number of central resources - 4
 - Max number of circuits on a single central source - 16

Box Clever is factory preset to an automatic DHCP = if you have a fixed IP is necessary to change this,through a web interface IP address eLAN just find using a magnifying glass search press to find eLAN network or other software - IP scanner.



In our experience, it may happen that some browsers do not load eLAN properly (in practice mainly Internet Explorer), so use another, for example Google Chrome Opera, Firefox...

3. Assignment of detectors (80 Jablotron - OASIS)

It is a very similar level and one assignment takes place via the multifunction switching components RFSA-6x The detectors are distributed on-stage - which could be a monostable motion detector or a bistable door detector.

1. a monostable detector (motion), can use a two functions impulse when it detects motion (suitable for activating GSM)
2. delay return after detection (ideal for automatic lighting control)



How to do it:



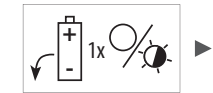
- Holding down the button will bring programming component to programming mode.



- Inserting the number of batteries defines the function (if you select 2).



- It is necessary to set the time (range 0-60min) and hold programming button on the component for 5 seconds (then the load-time is automatically indicated by a double flash).



- Stop loading time performing again by inserting the battery into the detector.



- Again press the programming button to save the settings function.

Batteries are inserted and pulled from the detector a total of 3 times. Deletion is performed in the same manner as in section one.

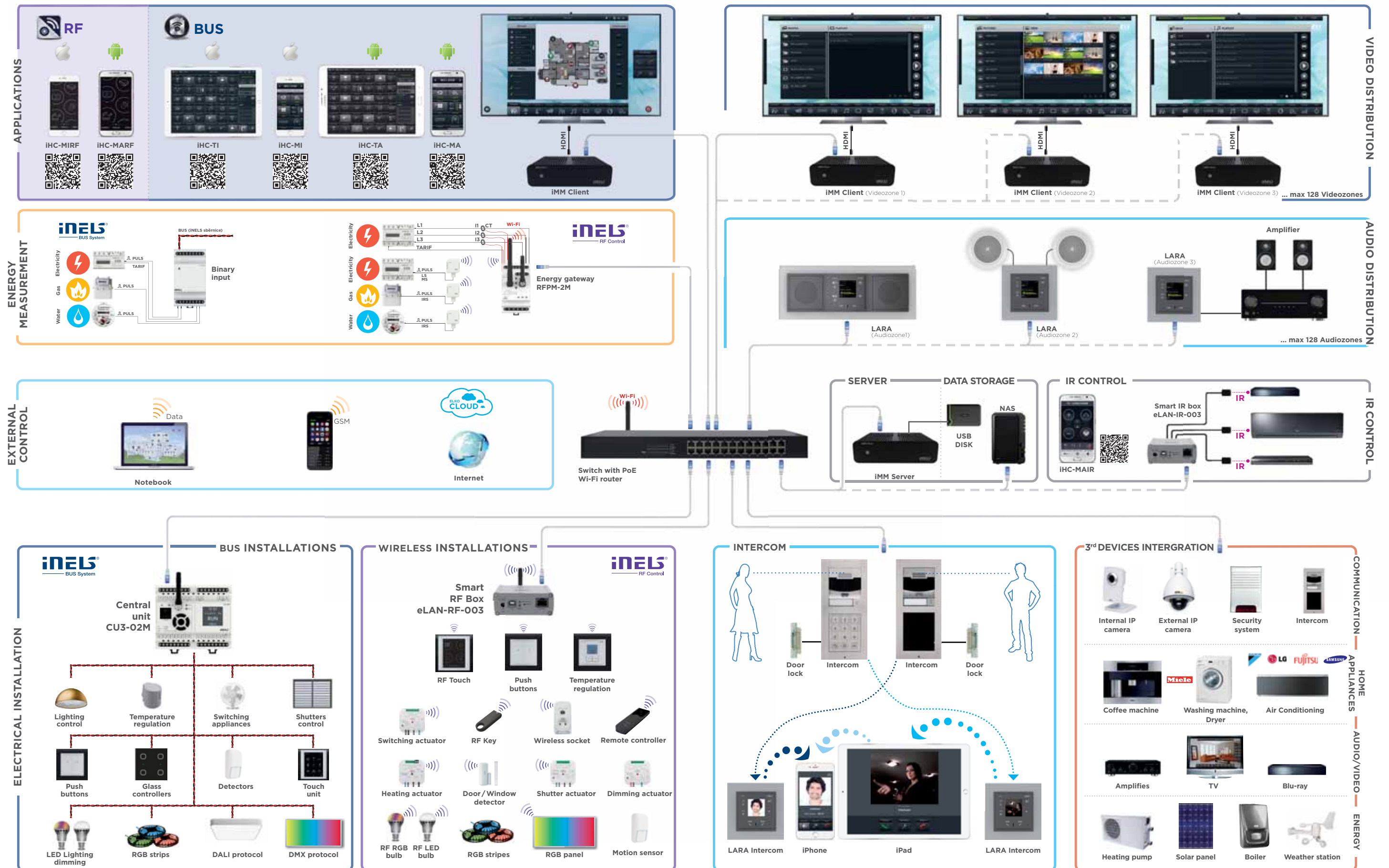
What to watch out for when joining various protocols between each other (= intermediary between device and smart phone).

Smart boxes themselves often have the logos of several standards, which indicates the compatibility of all elements among themselves.

The opposite is true, because that the HUB may be compatible with two of the thousands of equipment communications standards. This significantly reduces compatibility with existing devices in the installation.

Often at times there is also the complaint of „the mutual compatibility“ but incompatibility within the function = of the components within one system, with all the features (Eg Timing), but when connected to another system via HUB can only switch on and off.

How to connect the BUS version of iNELS?



5.1 What else you should know when you install

With two-way communication is confirmed by feedback on the state of the element within the system units (RF Pilot, Smart RF box eLAN ... RF Touch, RF-GSM-220M).

switching (on/off)

dimming (on/off/brightness)

shutters (open/close)

temperature (switched on/off/mode/temperature)

monitoring (detection)

Influence/interference of two systems iNELS RF Control installed next to each other is not possible because of the use of a unique protocol RFIO.

iNELS RF Control Boxes are made of non-combustible material and UV inhibitors which prolongs their lifespan.

In combination with the existing wiring can be installed iNELS RF Control products that have an „S“ (a classic button) RFSA-61B, RFDEL-71M, 71B RFDEL- Here the maximum line length is 10 m.

If there is a power failure (or the battery runs out) When the power is restored it is not necessary to re-program components After a power cycle, the state of the components (which should be according to the program) with the system controller carry out a follow-up action.

It is recommended for interference voltage to install RC members on components.

It is not recommended to install dimmers beside the contacts.

In the event that you are installing two (or more) control touch RF Touch units - use the sync function for the reason that you ensure equal status of all elements.

It is not recommended to install iNELS RF Control device for securing vital functions and also in industrial areas for operation (cranes, hoists ...) It is an environment with increased influence of interference.

For users of the system, there should be a difference of at least 1 second between the commands.

You can transfer data sending from one RF Pilot to a second RF Pilot.

5.2 Camera compatibility

1. AXIS



Camera model	Video Type	Zvuk
206(W)	M-JPEG	No
206M	M-JPEG	No
207M(W)	M-JPEG MPEG-4	Yes
207W	M-JPEG MPEG-4	Yes
209FD(-R)	M-JPEG MPEG-4	No
209MFD(-R)	M-JPEG MPEG-4	No
210	M-JPEG MPEG-4	No
.	.	.

2. D-Link



Camera model	Video Type	Zvuk
DCS-2102/2121	M-JPEG	No
DCS-2120	M-JPEG	Yes
DCS-3410	M-JPEG	No
DCS-700L	M-JPEG	Yes
DCS-900(A)	M-JPEG	No
DCS-900(B/B2)	M-JPEG	No
DCS-910/920	M-JPEG	No
.	.	.

3. The cameras support M-JPEG

6. BACKUP/UPDATE UNITS, RF TOUCH OR RF PILOT

The following procedure uses equipment RFAF/USB, which is the standard offered by ELKO EP and which is lent to system integrators.



Procedure for the update from version 2.23 to version 1.07x.

A condition of the migration is that the default firmware version in the RFT is at least 1.07 (or 1.07, b).

- On the RF Touch screen click on the Clock -> then on the „Settings“ -> enter the password (default: 1111) -> press the „other“ -> press the „down arrow“ -> press the „Update Software“ and click „enable“.
- Open the application „RF_AF_USB_0_02“ checkmark and choose the right carrier frequency RF Touch (EU - 868.5 MHz, RU - 868.1 MHz, USA - 915 MHz and AUS - 916 MHz).
- In the application, Click “Open” from the directory folder to update RF Touch select “Boot” set to the frequency:
 „RFT_FW_boot_107_to_2x_EU.bin“
 „RFT_FW_boot_107_to_2x_RU.bin“
 „RFT_FW_boot_107_to_2x_USA.bin“
 „RFT_FW_boot_107_to_2x_AUS.bin“
 ➔ press “Start”
- Now, select from the menu „SW updates“ and reboot the entire device: In the „Settings“ menu, press „Reset Device“, and then you just press „OK“ (do not enter password, so as not to delete the settings).
- After rebooting is complete delete (erase) and control (check) flash memory - counter to 2x 1024.
- Once the test has completed (about 3.5 min) and the RF Touch booted up to „white screen“ -> then disconnect the power and then reconnect to the RF Touch.
- Now the screen begins to accrue data, where it is already runs a listing of statuses and checking the HW RF Touch. When the last line is load-



- ing “wait for...”. Put your finger in the upper right corner of the display, until the last line of the statement shows „wait for radio“.
- It is now possible to load any remaining files Again in Click „Open“ and choose a file from the folder to update RF Touch. It does not matter in what order, but no one can be missed!
 „RFT_BLK_grafika_black_v206.bin“
 „RFT_BLU_grafika_blue_v206.bin“
 „RFT_FW_v206.bin“
 „RFT_FW2_v204.bin“
 „RFT_GRE_grafika_green_v206.bin“
 „RFT_MGN_grafika_magenta_v206.bin“
 - After uploading all files (each file about 2 min At an efficiency of 98%) once again disconnected the RF Touch from power RF Touch will remember its settings, there is no loss settings.
 - Connect the power supply -> after booting the RF Touch screen click on the Clock -> then in the upper left corner on the „Info“ -> FW: 2.23.

6.1 Backup parameters/update units eLAN-RF

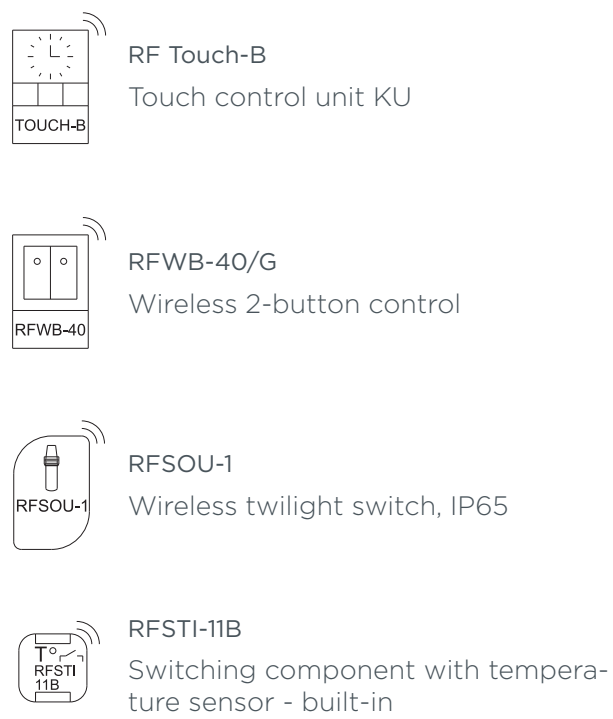


Project Support

Database of brands can be found here:

<http://www.elkoep.cz/podpora/podpora-projekce/knihovnyznaek/>

Examples of Branding Used



6.2 Did you know that...

- RF Pilot can group RFDA-73/RGB components under one control panel? It can operate more than 100 m RGB LED strips from one control window.
- The operations of the Smart RF box (eLAN-RF...) (controlled via smartphone) works without an Internet connection.
- RF Pilot shows the status of the commands: green tick - command is executed, red cross - the command is not exercised, orange tick - command is partially executed - When in one of the scenes and at least one of the eight commands has been performed. This can happen if the RF Pilot moving around and trying to control components e.g. moving from garden to house.
- RF LED bulbs white or RGB are controllable from a wireless controller and a switch in the current installation.
- Under one RF Touch command control unit up to 20 components can be assigned. these can be stored in up to 10 „Scenes“.
- Wireless switches are available in 36 frame designs (glass, wood, metal, stone...).
- When installing components RFDA-73/RGB (RGB strip) or RF RGB LED and subsequently controlling by RF KEY or wireless switch RFWB-40 - pressing channel 3 and then 2 activates the automatic blending of colors (in iHC-MARF/MIRF - Circus mode).
- In the event you want to wirelessly dim 2 KW (AC1) the solution is to connect the analog component RFDAC-71B Control Terminals (0-10V) to the dimmer DIM-6.
- For control via Smart RF box a tablet can also be used (size can not exceed 7“).
- It is true that one „scene“ can have up to 20 commands.

Installation price example:

Apartment

Functionality	Product Type	Price (CZK)
✓ heater control (2 zones)	2 x RFSTI-11B	3158,-
✓ lighting control (4)	4 x RFDEL-71B	6176,-
✓ awning	1 x RFSA-61B	1113,-
✓ appliance socket control	1 x RFSA-66M	2802,-
✓ door detector	1 x RFWD-100	980,-
✓ wireless switch	2 x RFWB-40	1592,-
✓ RF remote control with an OLED RF Pilot display	1 x RF Pilot	2814,-
✓ control via smartphone, tablets (smart box)	1 x eLAN-RF-003	4110,-

installation time 6 hours **22 745,-**

House

Functionality	Product type	Price (CZK)
✓ heating control (zone 3)	3 x RFSTI-11B	4737,-
✓ shutters (2)	2 x RFJA-12B	2816,-
✓ light control (Including dimming)	4 x RFDEL-71B	6176,-
✓ RGB LED strip control	1 x RFDA-73/RGB	2050,-
✓ appliance socket control	1 x RFSA-66M	2802,-
✓ irrigation operation	1 x RFSA-61B	1113,-
✓ windows open detector	2 x RFWD-100	1840,-
✓ wireless switch	2 x RFWB-40	1592,-
✓ control by RF Touch (Central touch unit)	1 x RF Touch/W	7174,-
✓ control via smartphone, tablets (smart box)	1 x eLAN-RF-003	4110,-

installation time only 1 working day **34 410,-**

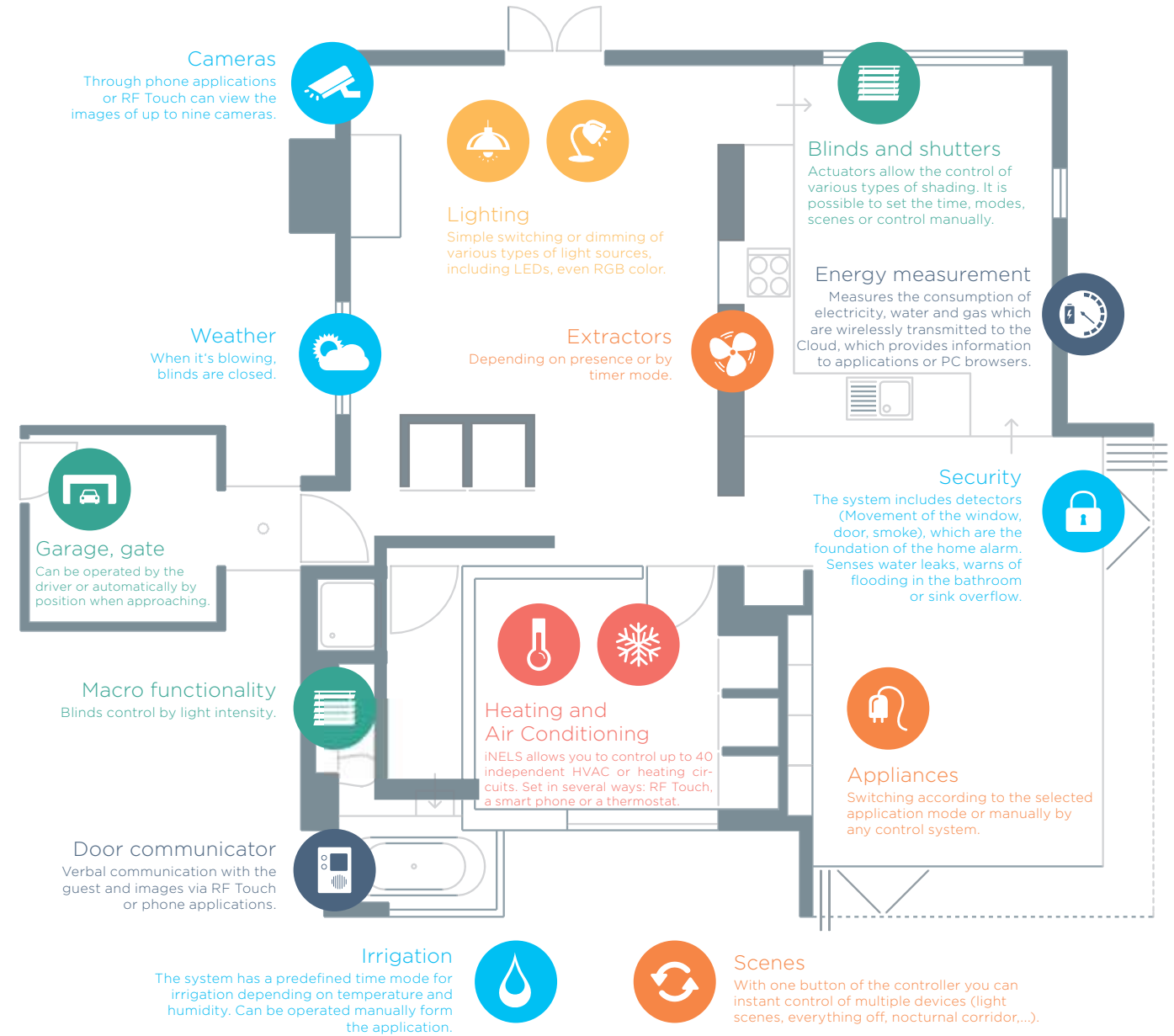
7. WHY SELL INELS RF CONTROL

- Comprehensive system = no need to buy components from different manufacturers. In the event that such components are required this increases the cost of purchase.
- Everything is 100% compatible with each other = one communication (RF Control). In the event you have a "smart box" with multiple protocols (Zwave, ZigBee, EnOcean...) This does not mean that all the components are compatible with each other - it depends on the "API" of the product that is implemented in the "smart box".
- Communication frequencies for building automation - the best results in communication.
- Bi-directional communication.
- Switches and dimmers can be connected to the existing button.
- System settings are possible without a PC.
- Application for SMART TV, SMART Watch Samsung gear S2.
- iNELS RF has components with higher loads, e.g. switching component with contact Tyco Electronics - 16A = 4000W (Ag-SnO material - for switching L, C load).
- Dimmers are universal using a light source with adjustable minimum brightness.
- All versions of iNELS RF Control are compatible with each other = from 2009 and beyond.
- Component housing does not contain combustible material and offers UV protection.
- The ability of measuring the quality of the signal between the controller and the component.
- Update - flash KEY RFAF/USB to update software.
- You can gradually add to the system, starting with just one controller and one component.
- Compatibility with BUS system.
- Customer tailored solutions (hotels, hostels).
- Online technical support - system partners have a single personal contact.
- Own production and development.
- The policy stipulates different sales discounts for system partners = end users do not get the same price. The idea of selling price of the

installation is that of the system partner (or the user starts with Smart sets) SP Service, other products are added to the SP.

- Support with exhibitions, demo cases, panels and training.
- iNELS RF Control system is not a toy.
- No license fees or other costs for sw (or applications).
- We did not minimize products to the detriment of less resistance.

8. WHAT CAN YOU CONTROL?



9. iNELS REFERENCES

Since creating the iNELS system we performed more than 5,000 installations.



Hyundai

Nošovice, Czech Republic

- 736 pcs LED High Bay within retrofitted lighting
- central control DALI ballast via EDMC
- control of each zone from the touch panel via app



Promeko

Olomouc, Czech Republic

- 27 apartments, 4 commercial
- heating, shutters, HVAC control
- video door-phone, intercom
- motion detectors and automatic light intensity in the communal areas



Chateau

Holešov, Czech Republic

- control (switch/dimm) of interior lighting
- touch panels
- fire alarm systems



Shop Dior

Praha, Czech Republic

- hardware: RF Control
- channel multifunction dimming actuator RFDA-71B
- single channel actuator with analog output RFDAC-71B
- RF remote control Pilot



Wellness Chateau

Petrovice, Czech Republic

- iNELS system controls:
 - 47 dimmable light circuits,
 - 63 switching light circuits
- control lighting SPA, swimming pools, ceramic loungers



Showroom Smart Light

Bratislava, Slovakia

- the entire building, including warehouse and exterior spaces, is controlled by iNELS intelligent electro-installation
- iNELS system controls:
 - 15 switching light circuits,
 - 5 dimmable light circuits,
 - 1 LED RGB light circuits, etc.



Buddha Palace

Bhutan, India

- lighting control of historical interior sections
- scenes light according to visitor presence
- security system



Cal Reiet Santanyi

Mallorca, Spain

- swimming pool technology control
- fountain control
- Guest Room Hotel Management System



Cinema Corvin

Budapest, Hungary

- 6 movie theaters
- DALI control LED matrix (800 lighting fixtures)
- projection scenes
- heating and A/C control



Sweet-shop Harrer

Sopron, Hungary

- all lights in the building are managed by iNELS system
- the system is controlled by central unit CU2-01M, it was programmed in IDM
- iNELS BUS System:
 - 6 dimming circuits,
 - 20 switching circuits



Hotel Merit Premium

Kyrenia, Cyprus

- all rooms are equipped with smart electro-installation
- this is controlled by RFSA units that switch set modes
- when designing a system, the emphasis was placed on the central function (MASTER switch)



Wyndham Grand

Istanbul, Turkey

- more than 3000 lighting circuits are controlled through the DALI protocol
- another thousand lighting circuits are controlled via DA3-22M units
- the brain of the whole installation is the central unit - CU3-01M

ELKO EP Holding



www.elkoep.com

rev.1