iNode Beacon

Instruction manual

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1. About iNode

We would like to introduce you to the family of iNode devices operating in Bluetooth Low Energy ® technology. We will show you that BLE is not only tags for finding lost keys or location tags, but something more.

Our devices can do this and more:

- These are primarily battery devices.
- Operate without replacing it for up to 12 months depending on the application and method of use.
- They have memory for recording events, measurement readings etc.
- Precise temperature, humidity, acceleration or magnetic field sensors allow for precise control of home automation or care for the elderly.
- As remote control devices, despite their low power consumption, they have a large range and features inaccessible to other competing devices - own user password, AES encryption, control directly from a smartphone.
- BT4.0 - LAN or BT4.0 - GSM gateways connect **iNode** sensors with the Internet.

iNode can also help control the movement of people or goods, saving the time of appearance and disappearance from the range of the recorder (active RFID® with a long range). New functionalities related to product development are also not a problem - it enables remote firmware exchange from a PC or smartphone with Bluetooth 4.0® and Bluetooth Low Energy® (Bluetooth Smart®) support.

iNode Beacon is intended to work as iBeacon or proximity beacon. It allows you to create navigation systems inside buildings. It is also suitable for marking various places, shops, etc. After detecting **iNode Beacon** with a specific UUID within its range, the application on a tablet or smartphone can provide the user with additional information related to this location, e.g. display an advertisement or play an audio file. One of the applications is the implementation of interactive guides to museums or exhibitions. The option of an additional password for authorizing the application on a smartphone or PC protects against copying.

It has a unique LED signaling function being within range of the scanning device.
The broadcasting time can be changed from 0.3 to 10 seconds.

It can pretend to be any other BLE proximity beacon. You don't need to have any specialized knowledge to do it. Just enter the data of the broadcast frame of such a device, e.g. compatible with the Eddystone ™ format.

Trademarks or registered trademarks:

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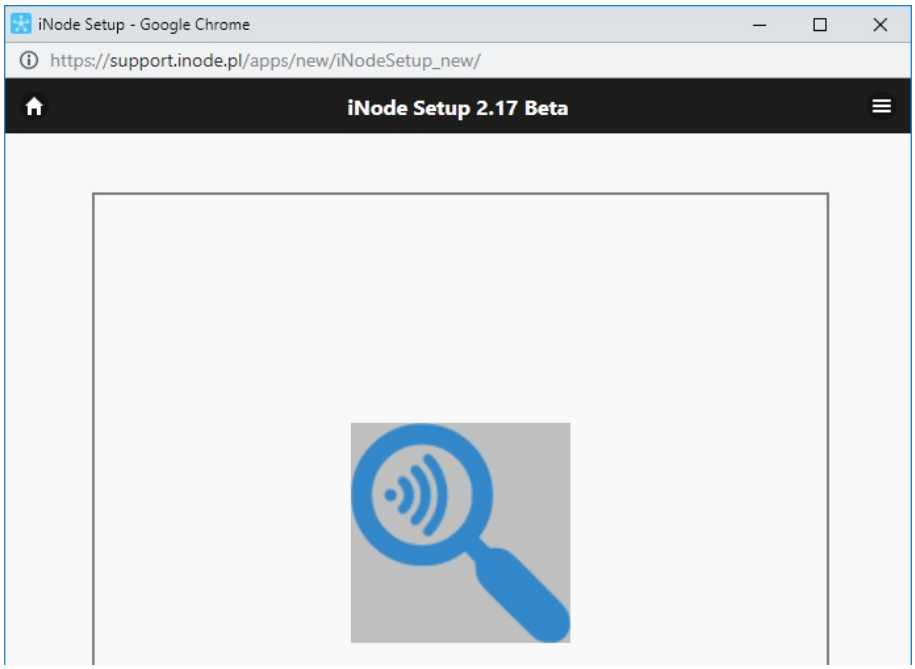
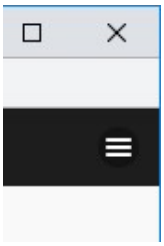
2. iNode Beacon

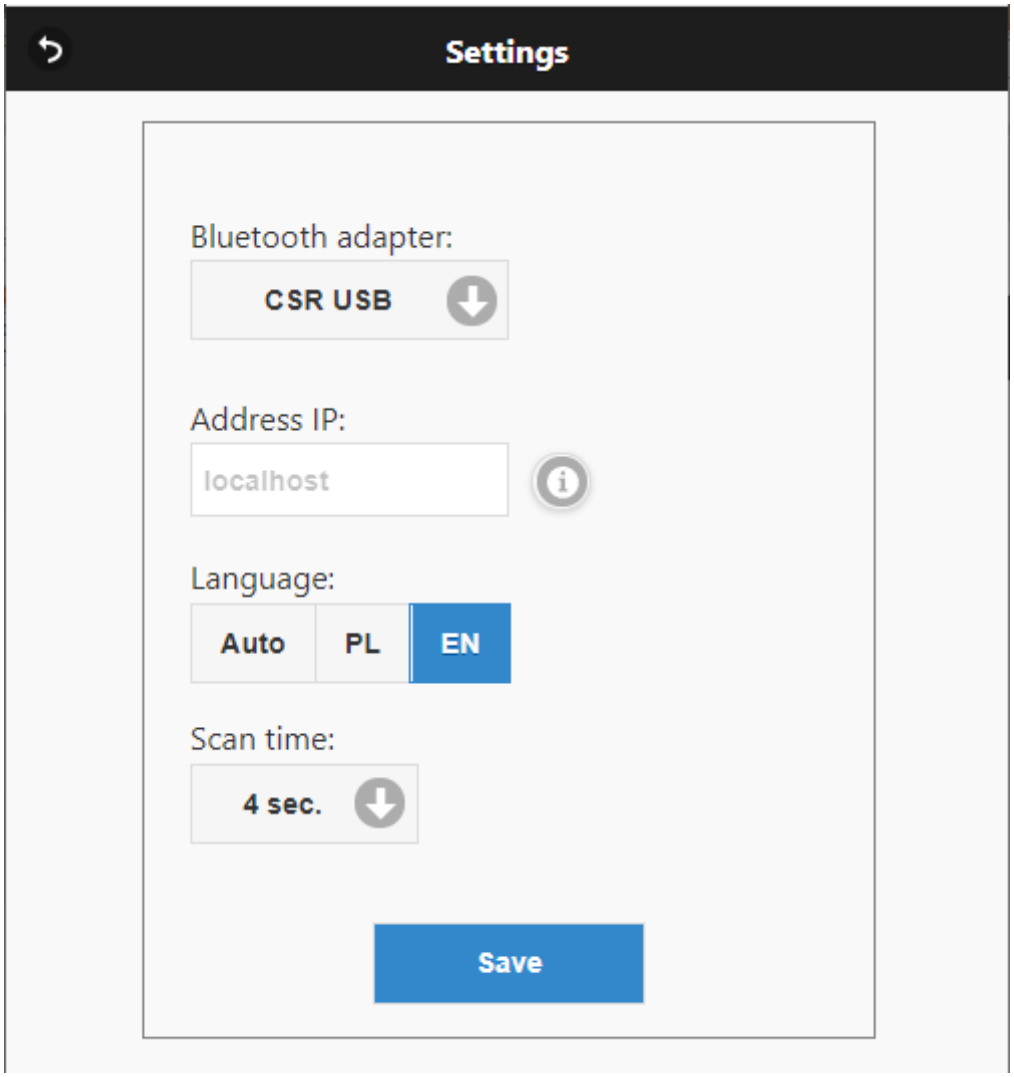
Run the **iNode Setup** application in your browser (preferably Chrome). Depending on the system, it may be necessary to install an additional program that allows the application to communicate with the USB adapter. On Windows 10 it is **iNode Hub Server** while on Android OS it is **iNode Service**. To search for BLE devices, press the blue button with the magnifying glass.



By clicking on the image



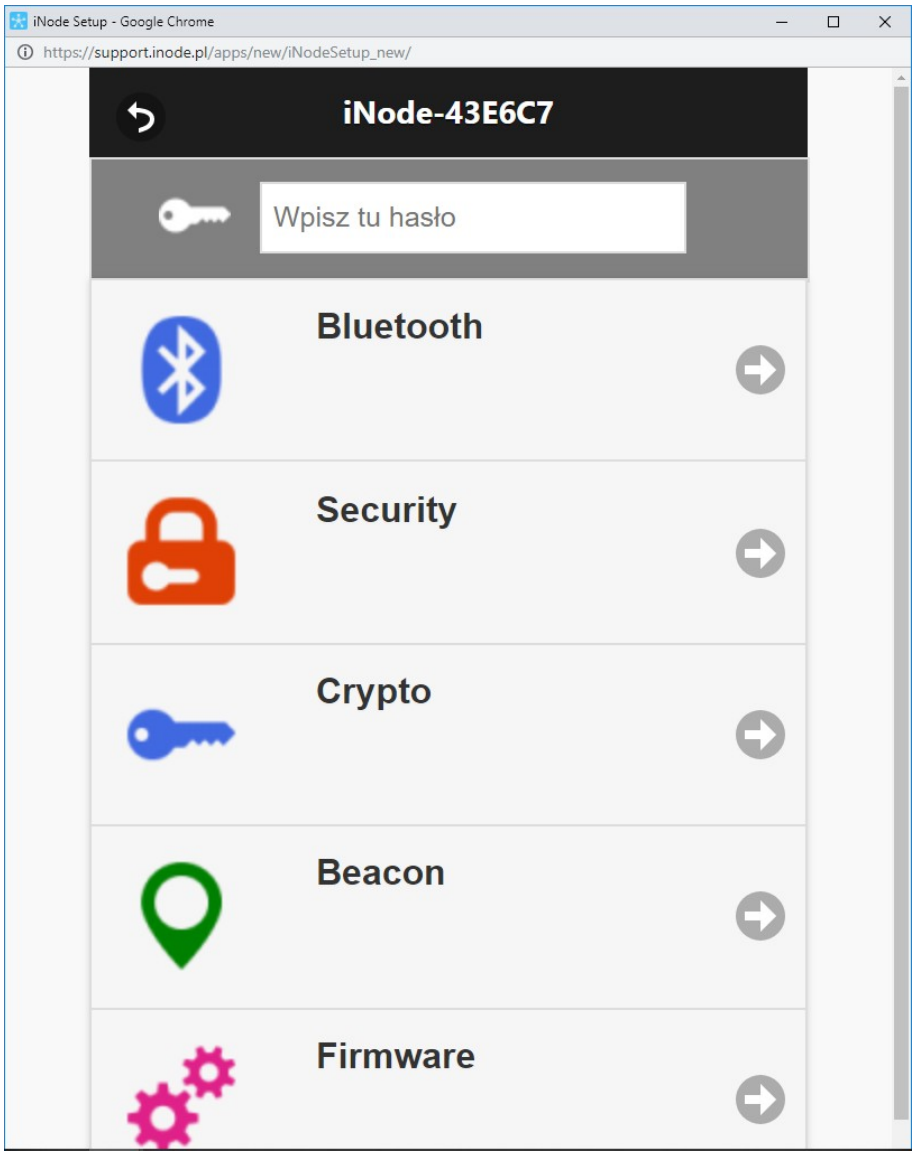
you can also choose the type of USB BT4.0 adapter with which the program works. It is also possible to use the **iNode LAN** series devices for communication, for which you must enter the IP address at which they are visible in the local network.



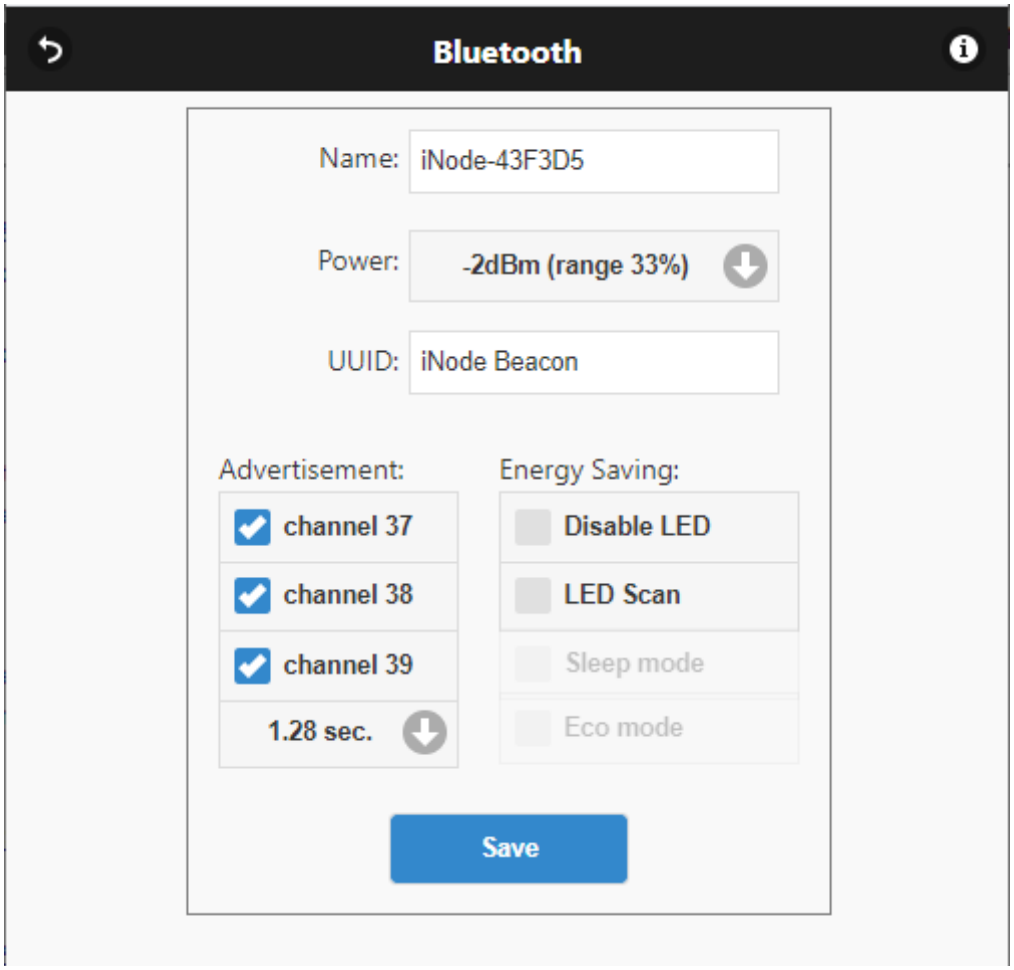
The program will search for the selected BT4.0 adapter and nearby **iNode** devices. For **iNode Beacon** this is the first image from the left in the first row in the window below.

iNode Setup - Google Chrome
https://support.inode.pl/apps/new/iNodeSetup_new/
iNode Setup 2.17 Beta
INode-43E6C7
D0:F0:18:43:E6:C7
-31 dBm
UUID
694E6F64-6520-4265-6163-6F6E00000000
30:28:9E:AE:77:DC*
30:28:9E:AE:77:DC*
-34 dBm
Unknown BLE device
INode-43E3C0
D0:F0:18:43:E3:C0
2.88 V
-57 dBm
19.92°C
29.8%
Si7021
INode-43E3BF
D0:F0:18:43:E3:BF
-68 dBm
UUID
694E6F64-6520-4265-6163-6F6E00000000
INode-43E3BE
D0:F0:18:43:E3:BE
-73 dBm
UUID
694E6F64-6520-4265-6163-6F6E00000000
03:19:88:67:86:06*
03:19:88:67:86:06*
-77 dBm
Unknown BLE device
INode-039918
D0:CF:5E:03:99:18
2.88 V
-83 dBm
20.27°C
33.3%
Si7021
P3 3AB37748
C6:9E:3A:B3:77:48
-128 dBm
Unknown BLE device

To configure the **iNode Beacon** device, left-click the image. The program will connect to it and read the configuration parameters set in it. If a password has been set in the device with which we want to connect, enter it in the window with the key.



After selecting the Bluetooth tab, the following window will appear:

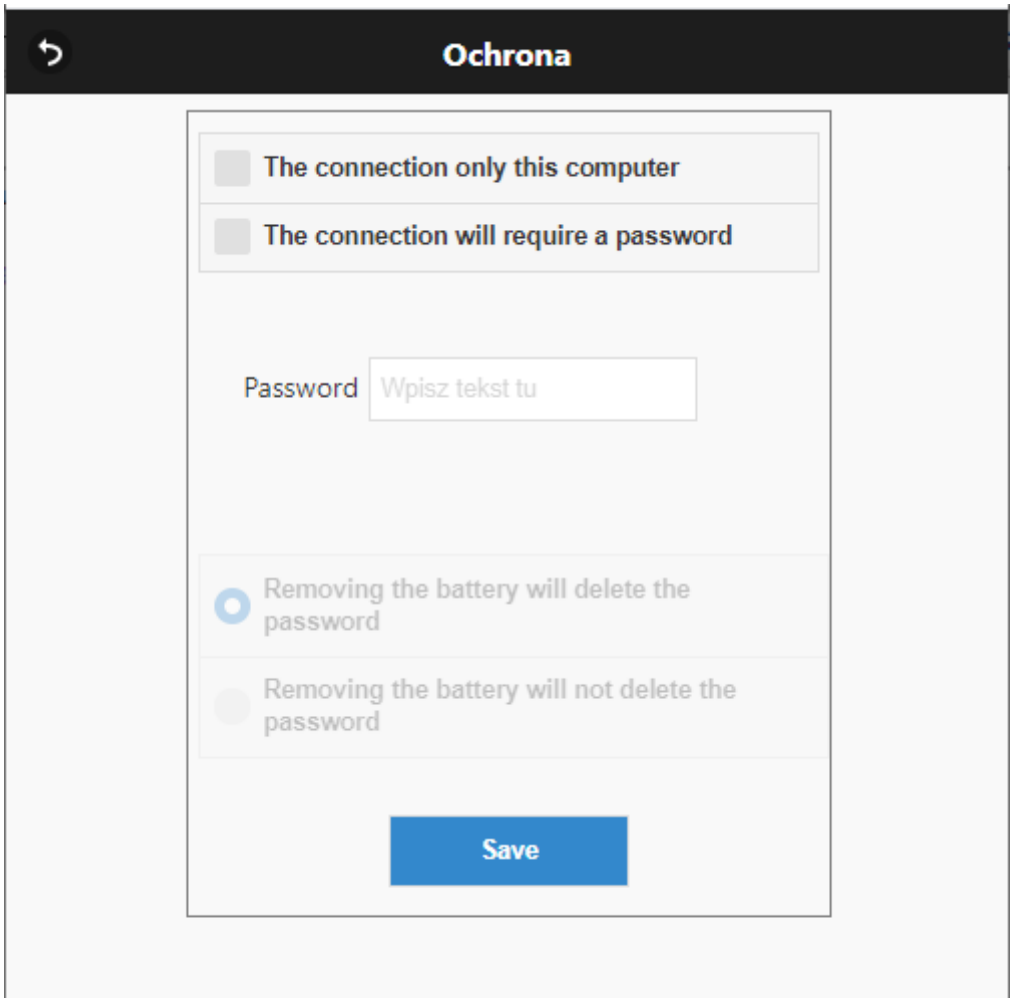


At the **Bluetooth** tab there are following items:

- **Name**: you can change default device name typing a new one in this text box. Its length is 16 characters maximum.
- **Power**: determines with what power the device transmits and at the same time the range from which it is detected e.g. by the **iNode Control Point** device (if the iNode Control Point has e.g. the set scanning range ~ *200m*, and the iNode Beacon the transmission power is set *-2dBm range 33%* is the effective distance from which the maximum iNode Beacon will be seen will be *200m * 0.33 = 66m*).
- **UUID**: it is necessary, for example, that **iNode Control Poin**t only searches for specific **iNode Beacon** devices - from a specific group, and not respond to others.
- **Advertisement**: we define the channels on which **iNode Beaco**n is broadcast, which in some applications may reduce battery consumption, however, the device may be less well detected. In addition, we can specify the period with which the broadcast frame is sent.
- **Energy saving**: we can turn off the LEDs or switch them to scan detection mode - **LED scan**.

Pressing the **Save** button will save the modified settings to your device.

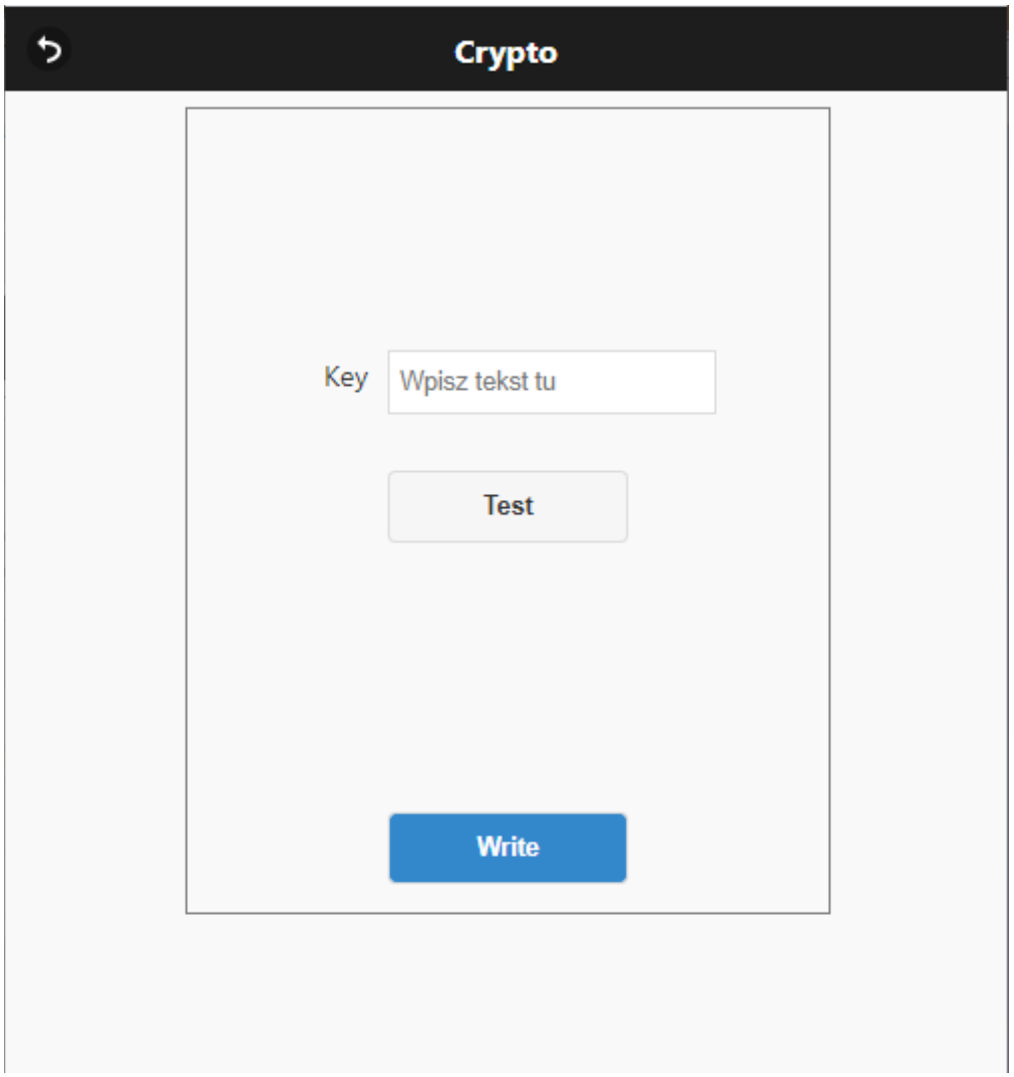
After selecting the **Security** tab the following window will appear:



- **The connection only from this computer**: we can secure ourselves against connecting to **iNode Beacon** from a different computer or smartphone than the one we are using now (in fact, the unique identifier of the BT4.0 adapter is remembered). You can only reset this setting by removing the battery from the device.
- **The connection will require a password**: we secure access to **iNode Beacon** with a password, which can be up to 16 ASCII characters.
- **Removing the battery will delete the password**: the option will be active only if the **The connection will require a password** option is enabled, the password will be required. Un-checking this option will save the password in the non-volatile memory of the device and removing the battery for a long time will not delete it. If the user forgets the password, the only way to regain access to the device will be to send it to the service.

Pressing the **Save** button will save the modified settings to your device.

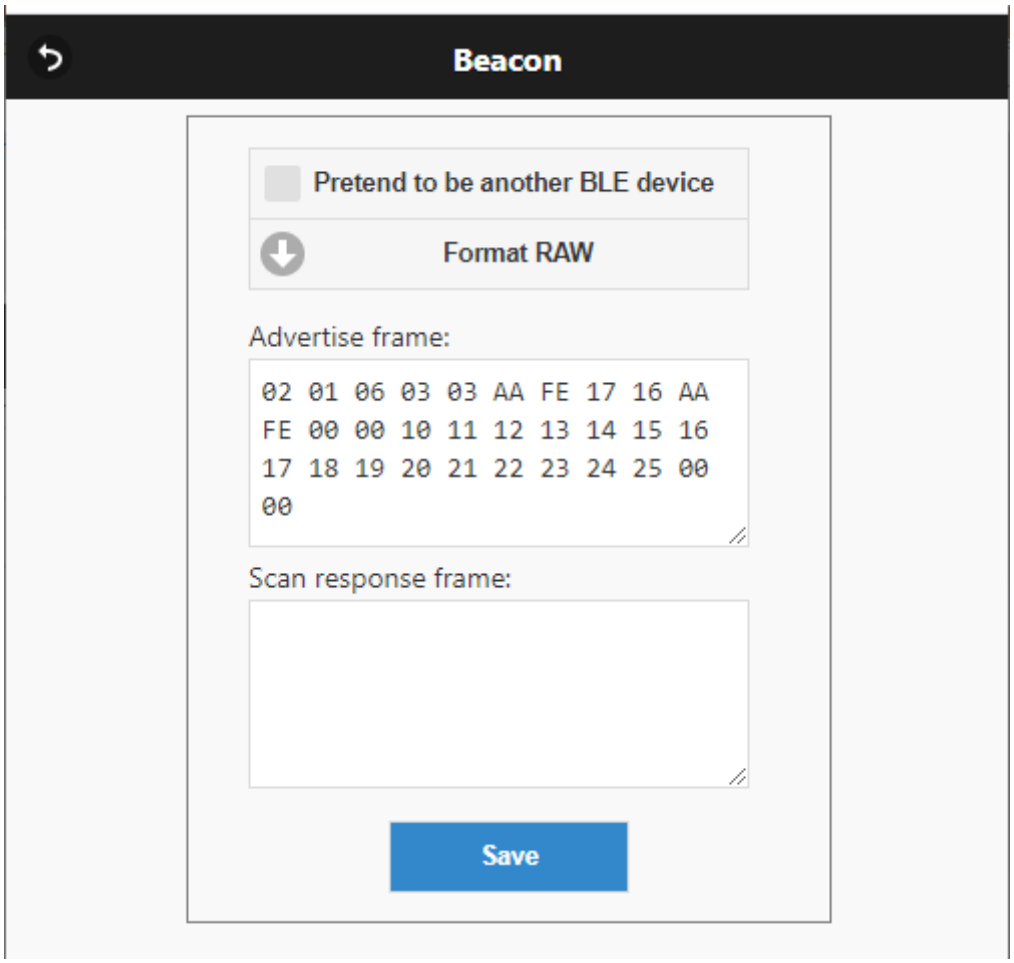
After selecting the **Crypto** tab the following window will appear:



- **Key:** we can enter a string of characters that can be used by the device to verify the application. This string cannot be read by the **iNode Setup** application, but you can test its operation by pressing the **Test** button.

Pressing the **Write** button will save the modified settings to your device.

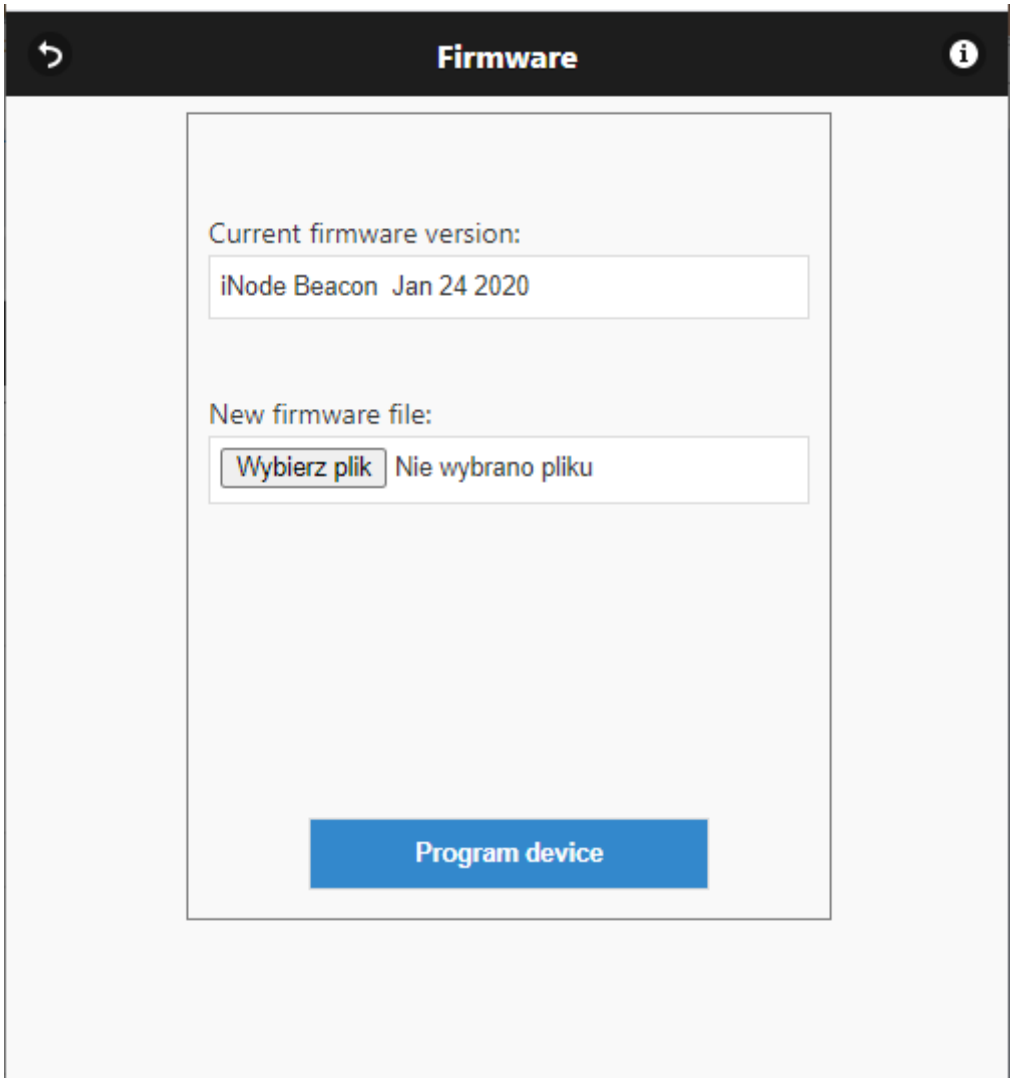
After selecting the **Beacon** tab, the following window will appear:



- **Pretend to be another device**: enable the pretend to be another BLE device function. It activates 120 seconds after saving to **iNode Beacon**. To disable this functionality, remove and replace the battery. Then we have 120 seconds to connect to the device with the **iNode Setup** program to deactivate this function.
- **Broadcast frame**: enter the data bytes of the broadcast frame of the device here that the **iNode Beacon** should pretend to be. By default, the Eddystone-UID frame is entered here - https://github.com/google/eddystone
- **Response to active query**: enter here the frame data bytes with the response to the query when scanning the device that **iNode Beacon** is to pretend.

Pressing the **Save** button will save the modified settings to your device.

After selecting the **Firmware** tab, the following window will appear:



The firmware version of the device is displayed in the **Current firmware version** field and the date it was created.

In the **New firmware file** field we can select a file with new firmware for the device. After pressing the **Program device** button, the program checks whether the selected firmware can be entered into the device. This avoids the situation that we enter, for example, firmware from the **iNode** device that requires pressing the button to make it broadcast to a device that does not have such a button (then we will lose the opportunity to communicate with such reprogrammed **iNode**).

The fep files with firmware, instructions or application software can be downloaded from the support site: https://support.inode.pl/ user: **inode** without password.

3. Battery replacement

The **iNode Beacon** CR2032 battery should last up to 12 months. In the case of a 14250 battery that has five times the capacity, it will be correspondingly longer. In fact, the speed of its consumption depends on many factors, e.g. operating temperature, frequency of cooperation with a PC or smartphone (reading of recorded data), set transmission power level, etc. The battery voltage characteristics as a function of time (energy consumed from it) is for a long time. practically flat. Only at the end of the battery voltage begins to decrease rapidly, and its internal resistance increases, which leads to rapid wear.

To replace the CR2032 battery:

1. Open the housing:
   The **iNode** case can be opened without using tools. It is most convenient to do it just like a nut shell opens. That is, insert your thumb nails into the gap between the two parts of the housing and open it. Inside is a printed circuit board, most of which is occupied by a metal battery holder.
2. Remove the circuit board from the housing. The battery is inserted into the side grip. It cannot be removed if the board is in the housing.
3. Slide the old battery out of the holder.
4. Insert a new battery:
   The battery, like a coin, has two sides. One of them has a large "+" sign and usually the name of the company. The other side usually has no markings. The battery should be inserted so that the side marked with "+" touches the metal handle (the "+" sign also has it). If the operation was carried out correctly, the LED should start flashing.
5. Insert the plate into the housing:
   The circuit board is not perfectly round. It has a slight chamfer on one side. It corresponds to a small bulge inside the housing. When inserting the plate into the housing, make sure that these two elements are opposite each other.
6. Close the housing:
   On one of the housing parts there is a pin that prevents the battery from sliding out of the holder. It must be set so that it is close to the bevel described in the previous point. Only with this setting can the housing be closed.

To replace the 14250 battery:

1. Open the housing;
2. Slide the old battery out of the holder.
3. Insert a new battery paying attention to the polarity (minus in the direction of contact with the spring or as described).
4. Close the housing:

4. Technical information

Radio parameters:

- RX / TX:
  - BLE: 2402-2480 MHz
- output power (maximum):
  - BLE: + 8dBm or + 20dBm
- modulation:
  - BLE: GFSK
- antenna:
  - internal PCB

Software parameters:

- configurable from a PC:
  - power with which the device works in the range from -18 dBm to + 8 / 20dBm (depending on the device version);
  - device name;
  - UUID broadcast - 16 ASCII characters;
  - mask of channels used for broadcasting;
  - broadcast frame data and with the answer to the query in imitation mode of another BLE device;
  - user password;
  - device access password; independent of the user's password, the password for authorizing the application on a smartphone or PC (protects against copying it and against use by another client);

Power supply:

- CR2032 or 14250 (1/2 AA) or CR2 battery;

Housing:

- plastic;
- dimensions:
  - CR2032: Ø 32 mm x 9.5 mm;
  - 14250: Ø 39 mm x 38 mm;
  - CR2 / 14250: 52mm x 32 mm x 19 mm;

Others:

- signaling by means of LEDs:
  - work in broadcast mode
  - scanning by another BLE device
- possibility of remote software exchange; alternative firmware: **iNode Beacon T**;
- temperature sensor with a resolution of 1 ° C;
- working temperature: from -20 to 45 ° C;
- humidity: 20 - 80% RHG;
- weight: 5 - 30 g;

Equipment:

- CR2032 or 14250 (1/2 AA) or CR2 battery depending on the housing;

Software:

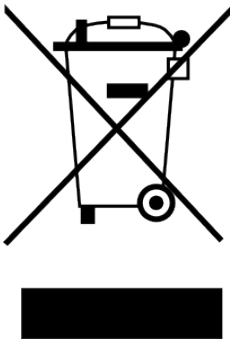
- Windows NT/XP/Vista/7.0/8.0/8.1/10.0;
- Linux;
- Android;

Chipset:

- CSR1010 or EFR32;

THE MANUFACTURER RESERVES THE RIGHT TO MAKE CHANGES AND/OR IMPROVEMENTS IN DESIGNS, FEATURES & DIMENSIONS WITHOUT NOTICE AND WITHOUT INCURRING OBLIGATION

5. Correct disposal of the product (waste electrical and electronic equipment)



The packaging materials are 100% suitable for use as a secondary raw material. The packaging should be disposed of in accordance with local regulations. Keep packaging materials out of the reach of children as they pose a source of danger. The marking on the product or in related texts indicates that the product should not be disposed of with other household waste after it has expired. To avoid harmful effects on the environment and human health due to uncontrolled waste disposal, please separate the product from other types of waste and recycle responsibly to promote the reuse of material resources as a permanent practice.

Correct disposal of the device:

- In accordance with WEEE Directive 2012/19 / EU, the symbol of a crossed-out wheeled waste container means all electrical and electronic equipment subject to separate collection. At the end of its useful life, this product may not be disposed of together with normal municipal waste, but should be taken to a collection point and recycling of electrical and electronic devices. This is indicated by the symbol of the crossed-out wheeled waste container, placed on the product or in the operating instructions or packaging.
- The plastics used in the device can be reused in accordance with their markings. Thanks to the reuse, use of materials or other forms of use of used devices, you make a significant contribution to the protection of our natural environment.
- For information on the appropriate disposal point for used electrical and electronic devices, please contact your local municipality administration or the seller of the device.
- Used, completely discharged batteries and accumulators must be disposed of in specially marked containers, taken to special waste collection points or sellers of electrical equipment.
- Users in companies should contact their supplier and check the terms of the purchase contract. The product should not be disposed of with other household waste.

Numer Deklaracji 1/02/2019 Data wystawienia Deklaracji 08.02.2019 r.
Number of declaration of Conformity *Date of issue of declaration*

DEKLARACJA ZGODNOŚCI WE
EC DECLARATION OF CONFORMITY

My/*We*: **ELSAT s.c.**
(nazwa producenta / producer's name)
ul.Warszawska 32E/1, 05-500 Piaseczno k/Warszawy
(adres producenta / producent's address)

niniejszym deklarujemy, że następujący wyrób:
declare, under our responsibility, that the electrical product:

iNode Beacon 0x0801
CR2032; CR2/14250; 14250;
(nazwa wyrobu / product's name) *(model / model)*

spełnia wymagania następujących norm:
to which this declaration relates is in conformity with the following standards:

PN-ETSI EN 300 328 V2.1.1:2016-11
PN-ETSI EN 301 489-1 V2.1.1:2016-11
PN-ETSI EN 301 489-17 V3.1.1:2016-11
PN-EN 50498:2010
PN-EN IEC 63000:2019-01
PN-EN 62479:2010

jest zgodny z postanowieniami następujących dyrektyw:
following the provisions following directives:

Dyrektywa RED 2014/53/UE
Dyrektywa EMC 2014/30/UE
Dyrektywa LVD 2014/35/UE
Dyrektywa RoHS 2011/65/UE

Rok, w którym umieszczono oznaczenie CE na produkcie: 2014
The year in which the CE marking placed on the product: 2014

08.02.2019 r. Paweł Rzepecki

Piaseczno k/Warszawy
(data i miejscowość / date and place)

Współwłaściciel
(podpis i stanowisko / signature and function)