

IntesisBox®

IBOX-KNX-ENO-A1 v2.0

User's Manual

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Gateway for integration of EnOcean devices into KNX TP-1 (EIB) control systems.

Application's Program Version: 2.0

Order Codes: **IBOX-KNX-ENO-A1**
IBOX-KNX-ENO-A1C

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1. Presentation



IntesisBox® IBOX-KNX-ENO-A1 allows a complete and natural integration of EnOcean devices into KNX control systems.

Main features:

- Reduced dimensions
- Quick installation.
- External power not required. Supplied through KNX bus.
- Fully bidirectional.
- Supporting up to 253 KNX communication objects.
- Up to 32 simultaneous channels or nodes and up to 5 devices per channel.
- Fast and easy integration with IntesisBox® EnOcean gateways for air conditioning.
- Easy way to add new EnOcean devices by using a XML file.
- EnOcean devices quality signal reception shown in the gateway LCD.
- Internal LCD to setup/monitor EnOcean devices.
- Intuitive and easy setup by using an ETS plugin with no need of any external software.
- Multiple objects for control and status (bit, byte, characters...) with KNX standard datapoint types.
- Status objects for every control available.

2. Quick Setup



Figure 2.1 IBOX-KNX-ENO-A1 / A1C integration example

Due to the flexibility of the gateway and the plugin, some of the following steps can be done in a different order. If you are familiar with KNX and EnOcean technologies you will be aware of that. Therefore, next we present a typical configuration process, but it is not the only way to do it.

1. Connect IBOX-KNX-ENO-A1 to the KNX bus (section 3.1) and check EnOcean devices location (section 3.2).
2. Open the IntesisBox® IBOX-KNX-ENO-A1 plugin in the ETS (section 4).
3. Add new device(s) (section 4.1.1).
4. Select the communication objects to be used and other parameters. This step can be omitted if working with the default objects and parameters (sections 4.1.2, 4.1.3 and 4.1.4).
5. Download the application program.
6. Teach/Learn EnOcean devices.
 - a. Manually: Using EnOcean device and/or gateway buttons (section 5).
 - b. Remotely: Through the plugin tab **Remote EnOcean Teaching/Learning** (section 4.2)
7. Close the plugin and apply changes when asked.
8. Link the group address from the communication object of the KNX device with the communication object inside the IBOX-KNX-ENO-A1.

Next, you can see a specific example integrating a window contact using our plugin and the gateway.



Figure 2.2 IBOX-KNX-ENO-A1 / A1C and window contact integration example

In order to see an example, we are going to proceed with the integration of an *EnOcean Window Contact* with a free-potential contact from a KNX actuator.

1. Assuming that we have a KNX actuator with free-potential contacts, and also that in the channel 1 from this actuator we have the 1/1/1 group address already linked.
2. Open the IntesisBox® IBOX-KNX-ENO-A1 plugin in the ETS.
3. Click on the “Add Device” button.
4. Select the first option to integrate a physical EnOcean device (already selected by default).
5. Select “Contact” in the group drop-down menu.
6. Select “Window Contact” in the EnOcean devices menu.
7. Click on “Add device” (the window will be closed).
8. Select the communication objects to be used (this step can be omitted if working with the default objects).
9. Move to the **Remote EnOcean Teaching/Learning** tab and click on the **Download Parameters** button (a message window will pop-up indicating process progress).
10. Close the plugin and apply changes when asked.
11. Then link the group address 1/1/1 from the communication object of the KNX actuator with the communication object of the *Window contact* inside the IBOX-KNX-ENO-A1.
12. Download the application program.
13. Finally you only have to link the EnOcean Window Contact by pressing the gateway Learn/Teach button (an “L” appear in the LCD) and pressing learn (LRN) button in the EnOcean device.

That's it! Now you can try opening/closing the EnOcean *Window Contact* and the channel 1 of the KNX actuator should also open/close as configured.

3. Connection

3.1 Connection of the interface to the KNX bus:

Disconnect power of the KNX bus. Connect the interface to the KNX TP-1 (EIB) bus using the KNX standard connector (red/grey) of the interface, respect polarity and then reconnect power of the KNX bus.

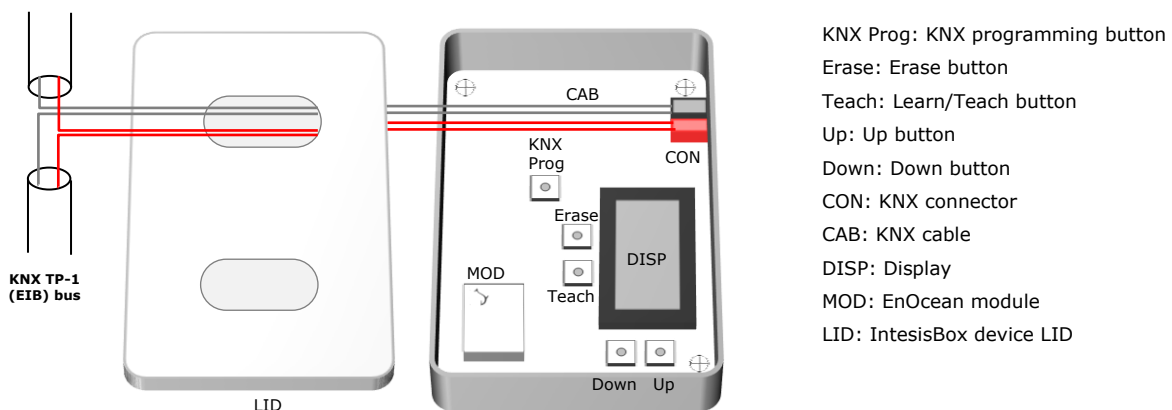


Figure 3.1 Connecting the IBOX-KNX-ENO-A1 to the KNX bus

Then it will start an initialization process, IntesisBox-KNX-ENO-A1 will be printed on the IntesisBox® device display for a few seconds (see the location of the display in Figure 3.1). The normal operation starts when display turns OFF.

It is important to bear in mind that changes made during the initialization process will not have effect until it finishes.

3.2 Connection of the EnOcean interface:

EnOcean protocol runs in a wireless mode, so no wiring is needed during the connection stage. To connect EnOcean devices with the IBOX-KNX-ENO-A1 EnOcean interface, please follow instructions in this manual and recommendation below.

3.2.1 Placement

The IntesisBox® interface antenna has a better sensibility when the device is placed vertically, and therefore this is the preferred position when placed (antenna zone should be located in the bottom side, floor side, once the device is fixed to the wall).

The coverage distance (see Table 3.1) of the signal emitted by the IntesisBox®, or by any other EnOcean device, is determined by the room geometry and where they are placed. As an example, long narrow corridors with wide walls are an adverse situation. People or other obstacles can reduce the coverage distance too. Therefore, is advised to always think in the worst possible scenario to decide the placement of the device to ensure a good stability in the radio system.

Coverage distance	Conditions
< 30 m	Under ideal conditions: broad room, no obstacles, good antenna design and good antenna positions.
< 20 m	The room is filled with furniture and people and penetration through up to 5 dry walls or up to 2 brick walls or up to 2 aero concrete walls.
< 10 m	Identical to the previous case but the receiver is placed to a room corner or range along a narrow floor.
< 1 m	Metal-reinforced ceilings at upright penetration angle (in strong dependence of reinforcement density and antenna positions).

Table 3.1 IntesisBox® coverage distance

3.2.2 Screening zones

It is important not to place the device in a place where the airwaves must go through a metallic object as they create a screening zone where the receivers are not going to be able to receive the EnOcean telegrams. This situation is shown in Figure 3.2 a.

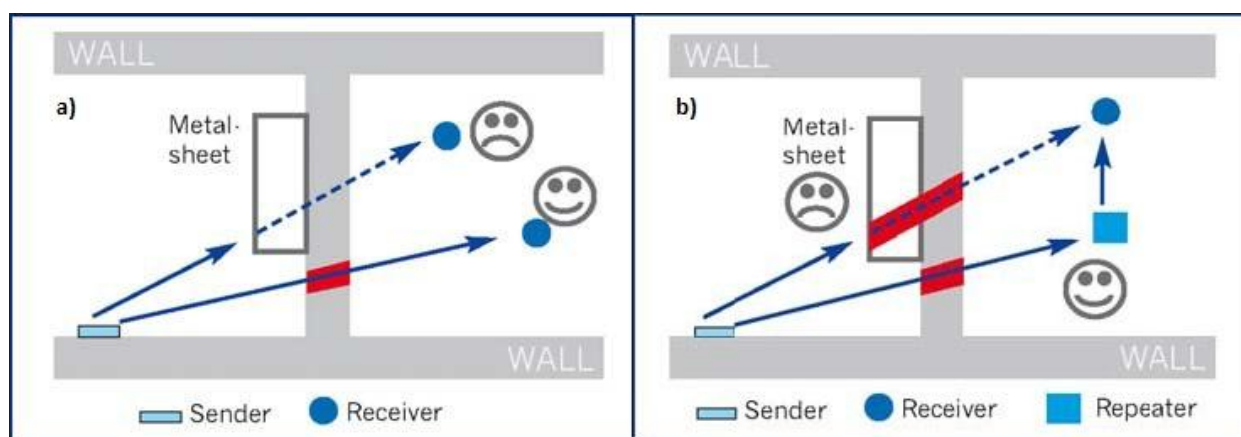


Figure 3.2 a) Screening zone b) Solution with a repeater

The situation of one of the receivers does not allow it to receive the transceiver telegrams. To solve this situation the use of a repeater outside the screening zone (Figure 3.2 b) is recommended. The telegrams will be retransmitted from there to the receiver

3.2.3 Penetration Angle

This is the angle in which the airwaves reach a certain object they need to go through. The transmission to the other side of the object would be better as this angle gets closer to 90°, being this the best transmission situation.

In Figure 3.3a it is shown a receiver in a situation where the penetration angle is too close to 0°. The solution to that problem can be seen in Figure 3.3b using a repeater in a different position.

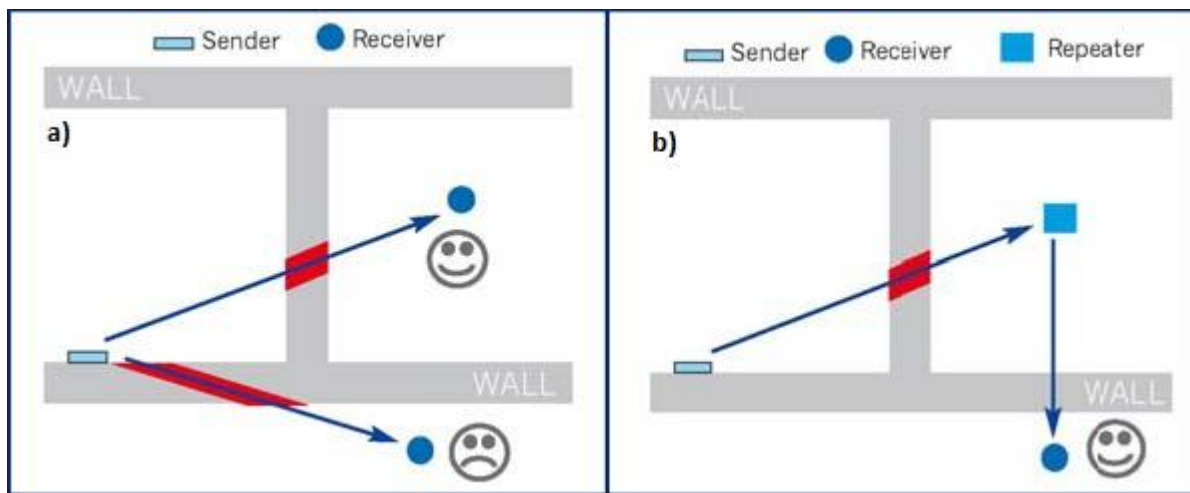


Figure 3.3 a) Penetration angle b) Solution with a repeater

3.2.3 Distance between receiver and sources of interference

The distance between EnOcean receivers, as it is the IntesisBox® and other transmitters (e.g. GSM / DECT / wireless LAN) or high frequency sources of interference (computers, audio and video equipment) should be higher than 50 centimeters.

However, EnOcean transmitters can be installed next to any other high-frequency transmitters without any problem.

3.2.4 Use of repeaters

In case of a poor radio reception, it may be helpful to use a repeater. EnOcean repeaters do not require any configuration, only a line-power supply is needed. A poor radio signal is received, refreshed and transmitted again, so nearly a double radio range can be achieved. Special EnOcean repeaters which can be switched to 2-level function allow two repeaters to be cascaded.

4. IBOX-KNX-ENO-A1 plugin for ETS

IBOX-KNX-ENO-A1 is a fully compatible KNX device which must be configured and setup using standard KNX tool ETS and our specific plugin.

ETS database for this device and the specific plugin can be downloaded from:

<http://www.intesis.com/download/eib/IBOX-KNX-ENO-A1.zip>

Please consult the README.txt file, located inside the downloaded zip file, to find instructions on how to install the database.

Once the database is imported, the plugin can be accessed when editing parameters. To get access to parameters edition you can right click on the gateway icon in the device tree (see **Figure 4.1**) and then select **Edit Parameters**. Another option would be to click on the **Parameters** tab, located in the project screen, and then pressing the specific parameter dialog (see **Figure 4.2**).

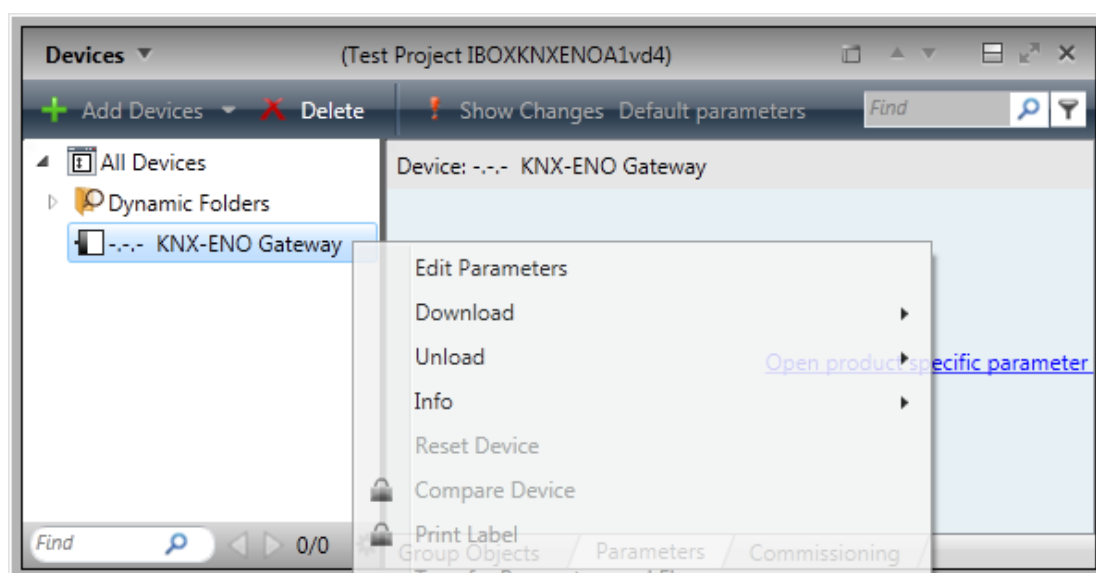


Figure 4.1 ETS Project managing screen

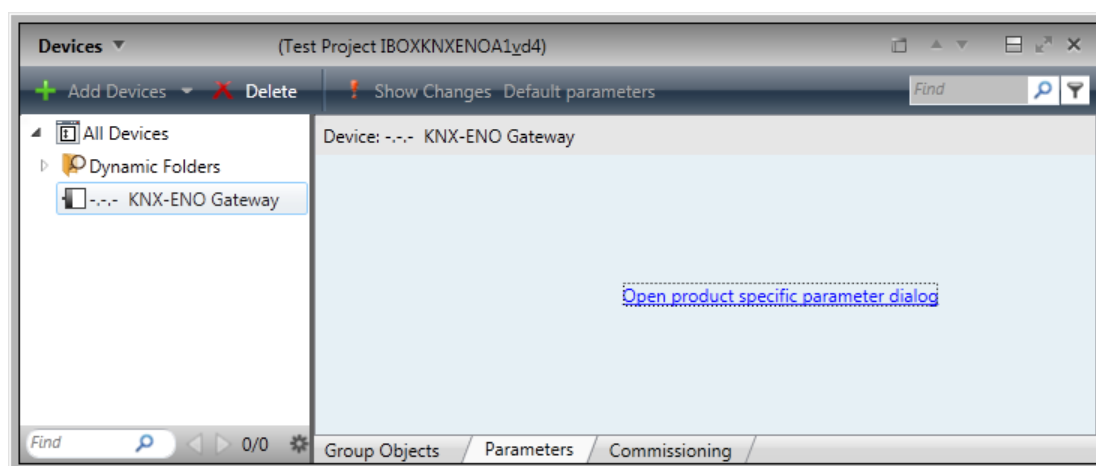


Figure 4.2 ETS Project managing screen

IBOX-KNX-ENO-A1 plugin is divided in 2 main sections: Gateway mapping and Remote EnOcean Teachings (see **Figure 4.3**). By default, users will be always directed to the Gateway mapping view.

4.1 Gateway mapping view

In this section, users will be able to add, erase and manage devices and their parameters. In **Figure 4.3** different available options are shown.

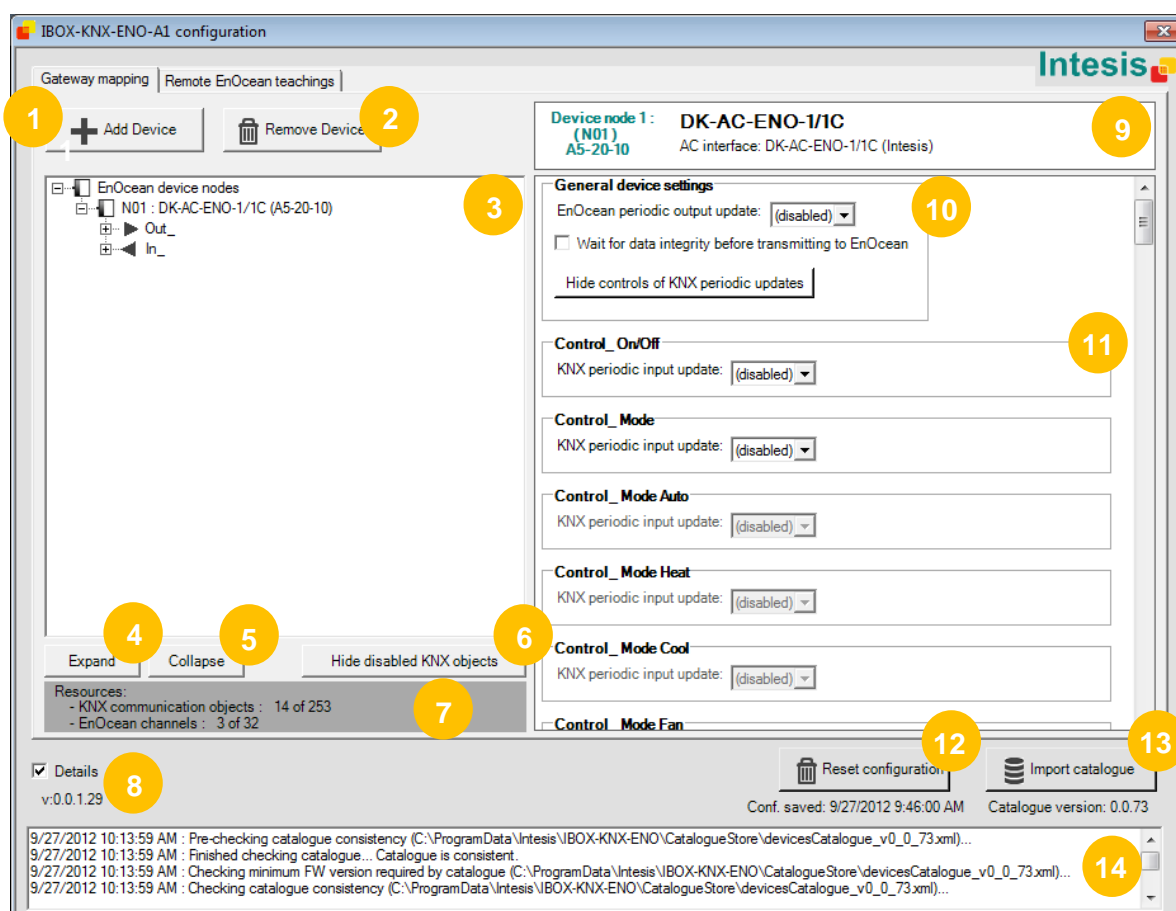


Figure 4.3 Plugin Gateway mapping screen

- 1 Add Device:** Adds a new EnOcean device (in detail in section 4.1.1).
- 2 Remove Device:** Removes an EnOcean device selected from the list (in detail in section 4.1.1).
- 3 EnOcean device list (Plugin-tree view):** List of EnOcean devices added and their communication objects. Communication objects can be enabled or disabled directly from this list (in detail in section 4.1.4)
- 4 Expand:** Expands the list of devices and communication objects.

- 5 **Collapse:** Hides the list of devices and communication objects.
- 6 **Hide/Show disabled KNX objects:** Allows showing or hiding all the disabled objects. This is useful to easily see only all the enabled communication objects and manage them.
- 7 **Resources:** Provides information about free channels and communication objects available.
 - a. **KNX communication objects:** KNX communication objects used from total.
 - b. **EnOcean channels:** Channels used from total. ¹
- 8 **Details:** When set, it prompts information about internal configuration operations.
- 9 **EnOcean Device:** Name/type of the selected device (as it appears in the LCD screen).
- 10 **General device settings:** General parameters values of the integrated device. More details in section 4.1.2
- 11 **KNX communication objects settings:** List of editable parameters for enabled communication objects. More details about communication object settings can be found in section 4.1.3 .
- 12 **Reset configuration:** Resets current configuration erasing all nodes and communication objects in the project. Text below the button indicates when the last configuration was saved.
- 13 **Import catalogue:** Imports a XML file with EnOcean devices. Text below the button indicates current catalogue version.
- 14 **Details:** When set, it prompts information about the configuration operations.

4.1.1 Adding / Erasing EnOcean devices from ETS

The "Add Device" button adds new EnOcean devices to be simulated or integrated into KNX. When clicking on the **Add Device** button, a selection screen pops-up (see **Figure 4.4**).

¹ All EnOcean devices occupy 1 channel except AC interfaces, which occupy 3 channels.

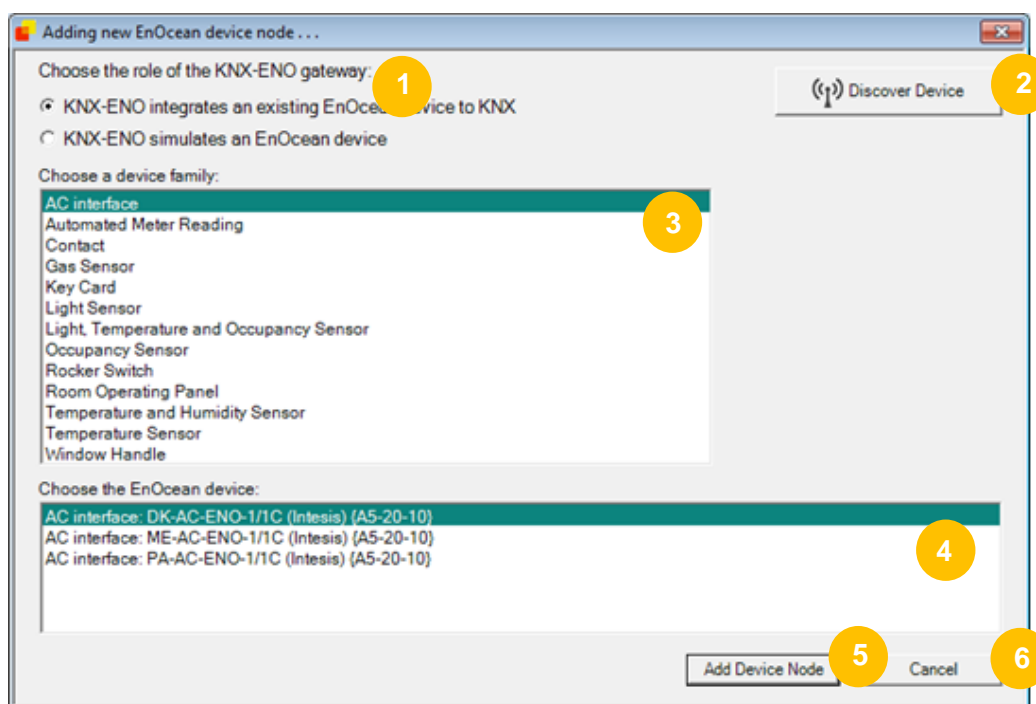


Figure 4.4 Add device pop up screen

- 1 KNX-ENO gateway role:** Select one of the radio buttons to get integration from KNX to EnOcean or from EnOcean to KNX.

KNX-ENO integrates an existing EnOcean device to KNX: Adds a new physical EnOcean device to the current configuration.

KNX-ENO simulates and EnOcean device: Adds a new simulated EnOcean device. *An EnOcean device is simulated from KNX (e.g. An EnOcean window contact could be simulated by using a KNX binary input contact).*

- 2 Discover device:** Click on the **Discover device** button and on the teaching/learning button of your EnOcean device. This will automatically select your device from the ones in the list². Therefore, parts 3 and 4 are selected automatically.

- 3 Choose a family device:** Select the group from the list that owns the EnOcean device to be integrated to find the proper device faster and in an easy way.

- 4 Choose the EnOcean device:** Select the EnOcean device to be integrated from the list.

- 5 Add device:** Adds the selected EnOcean device.

- 6 Cancel:** Cancel the process.

² In some cases, the application is not capable of establishing a one-to-one relation. In these cases, user only has to decide which is the precise device, but doesn't have to look for the whole catalogue, as a preselecting is done by the plugin.

The process to add a device is quite simple: You only have to look into the list for the EnOcean device to be added, select the device, and click on the “**Add device**” button.

To **add** another device, simply repeat the same process.

To **erase** an EnOcean device you have to select it in the plugin tree-view and click on the “**Remove Device**” button. The plugin will ask you for confirmation.

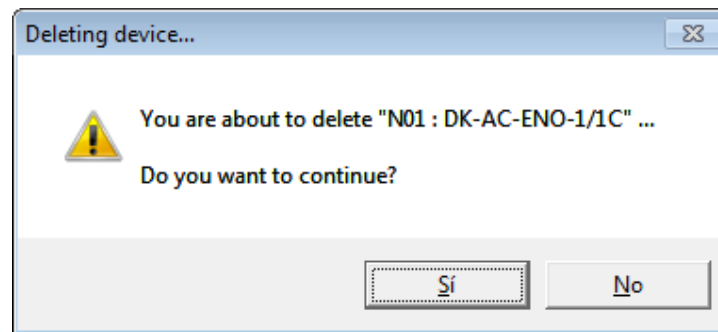


Figure 4.5 Confirm erasing an EnOcean device screen

4.1.2 General device settings

For each EnOcean device, there is a list of general settings that can be configured to ease the setup process. The list of available settings is listed in the KNX communication objects settings part of the screen. Bellow, there is a list of all available parameters. Keep in mind that these parameters will appear depending on the EnOcean device selected. Not all parameters are available for all EnOcean devices.

- a. **Data integrity Checkbox:** When selected, no data will be transmitted to the EnOcean interface until all data needed by the device is received from the KNX interface.
- b. **Hide controls of KNX periodic updates:** When selected, *KNX periodic input update* parameter for each communication object is not shown.
- c. **Contact:** Indicates the behavior of the gateway when receiving messages from the EnOcean device. Different options are:
 - i. **Report last value reported by any device**
 - ii. **Report “Open” only when all devices report “Open”**
 - iii. **Report “Closed” only when all devices report “Closed”**
- d. **Groupings:** Used to select the working mode of the rocker buttons. For each button and for each channel (pair of buttons) you have 4 different modes: *none*, *switching*, *dimming* or *shutter/blind*. More information about these modes and the associated DTP can be found in section 9.8.

4.1.3 Communication objects parameters

Depending on the communication object, certain parameters can be set up.

- a. **KNX periodic input update:** Indicates the period (in seconds) that the existing values will be sent to EnOcean cyclically. (*0= disabled; values from 10 to 2550, multiple of 10*).
- b. **Minimum/Maximum temperature setpoint (°C):** Indicates the maximum and minimum setpoint temperature desired in the project. Depending on each EnOcean device, values range may vary.
- c. **Switching operation:** Behavior of the button when pressed. 3 different modes available: *On*, *Off* and *Toggle*.
- d. **Short/long pulse threshold (ms):** Amount of time the button needs to be pressed to be interpreted as a long pulse.
- e. **Dimming operation for short (long) pulse:** Behavior of the button when pressed and dimming mode is selected. 3 different options available: *On* (increase), *Off* (decrease) and *Toggle*.
- f. **Dimming increase step value (on long pulse):** Defines the step value for the increase step when dimming mode is selected and long pulse is carried out.
- g. **Dimming decrease step value (on long pulse):** Defines the step value for the decrease step when dimming mode is selected and long pulse is carried out.
- h. **Dimming periodic step value sending (on long pulse):** Defines the amount of time that it takes to move from one step to the next one when the button is constantly pressed. This parameter will help in achieving a smoother dimming effect if combined with small step values.
- i. **Shutter/Blind operation:** Behavior of the button when pressed. 3 different modes available: *Up*, *Down* and *Toggle*.
- j. **Shutter/Blind method:** Behavior of the button when pressed. 2 different modes available: *Move-Step* and *Step-Move-Step*.
- k. **Shutter/Blind vanes adjustment time:** Defines the amount of time that it takes to move from one position to the next one.
- l. **Shutter/Blind operation (top button / bottom button):** Behavior of the button when pressed. 2 different modes available: *UP/Down* and *Down/UP*.

4.1.4 Enable and disable communication objects

Once we have one or several EnOcean devices, these and their communication objects will appear in the plugin tree-view (expand the devices in order to see the communication objects or click on “**Expand**” button).

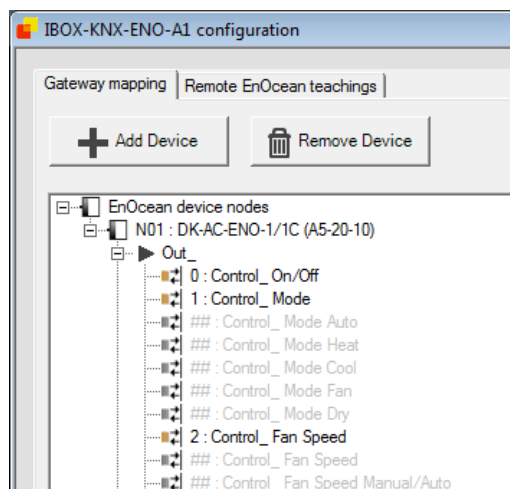


Figure 4.6 Plugin tree view

The greyed communication objects are disabled. To enable these objects just click on them with the mouse right-button and select “**Enable**”. To disable them, repeat the same process but selecting “**Disable**”.

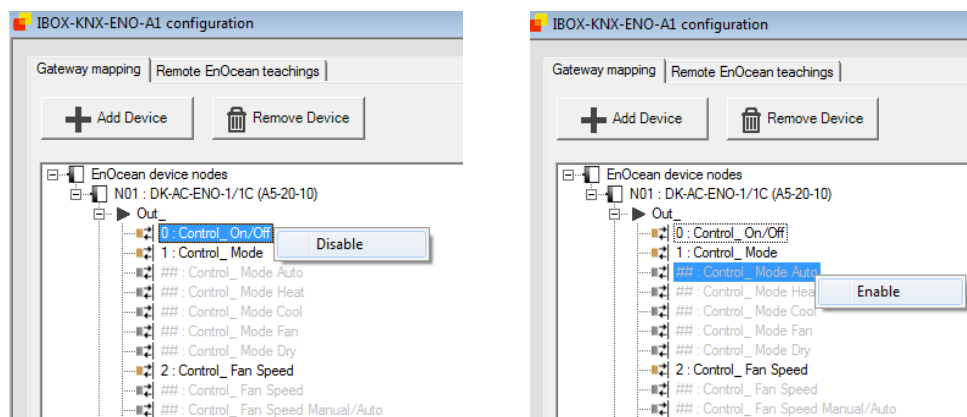


Figure 4.7 Enable Disable EnOcean devices

To check the datapoint type (DPT) and the functionality for each communication object simply point the mouse over the desired object and this information will appear. This is very useful in order to know which value sent from KNX enables the desired feature associated to the communication object. A summary of this information can be found on the section 8 of this document.

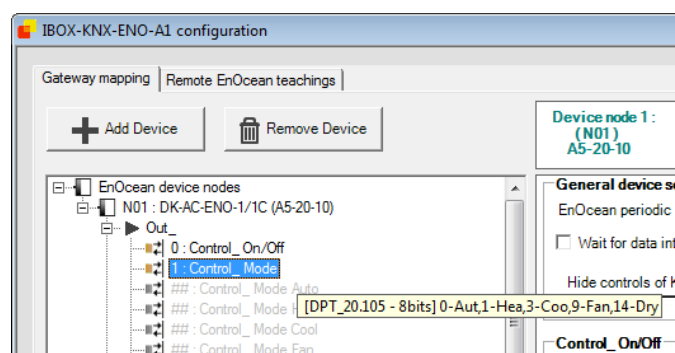


Figure 4.8 Communication object DPT information

In some cases, when grouping is active for instance, enabling and disabling communication objects from the device tree is not allowed. Therefore, if you are trying to disable/enable a communication object from a rocker button, make sure that you use the General settings section to do it and not right clicking on the device tree directly.

4.1.5 Add a new catalogue

Our catalogues include all available EnOcean devices that can be integrated into KNX through our gateway. When new products are included in the catalogue this file has to be updated to configure the gateway using these new products.

To do it so, please download the latest version of the catalogue through our web site. Then click on the **Import Catalogue** button and select the location of the file that has to be imported (see Figure 4.9 catalogue for more details).

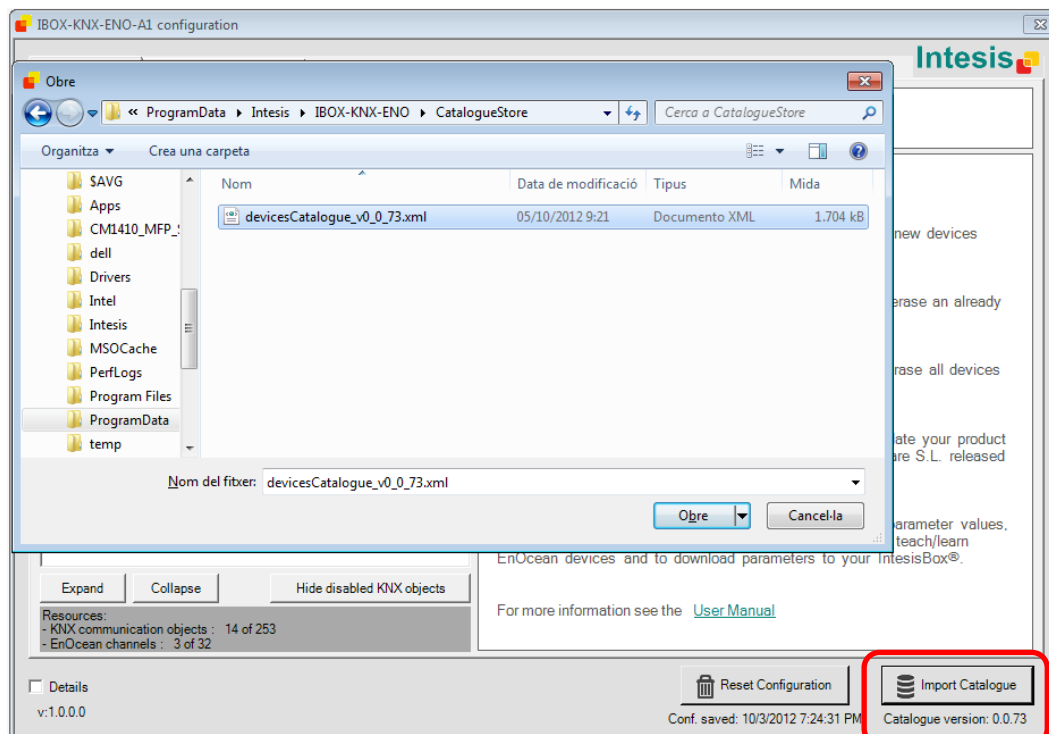


Figure 4.9 Importing new catalogue

Remember that you can only use XML files provided by Intesis Software S.L.

4.2 Remote EnOcean Teaching/Learning

Once you have customized device parameters and communication objects, it is time to import EnOcean device chip information to establish proper communication between our KNX-ENO device and the EnOcean devices.

IBOX-KNX-ENO-A1 offers two different modalities to *Learn/Teach* EnOcean devices. You can program them by pressing the Teaching button on the device itself (see section 5) or you can use the remote option of our plugin.

In case you want to Teach/Learn EnOcean devices manually, you just have to close the KNX-ENO plugin and download your configuration file as usual from ETS. On the other hand, if you want to carry out the Teaching/Learning process remotely, please go to the **Remote EnOcean Teaching/Learning** tab (see Figure 4.10).

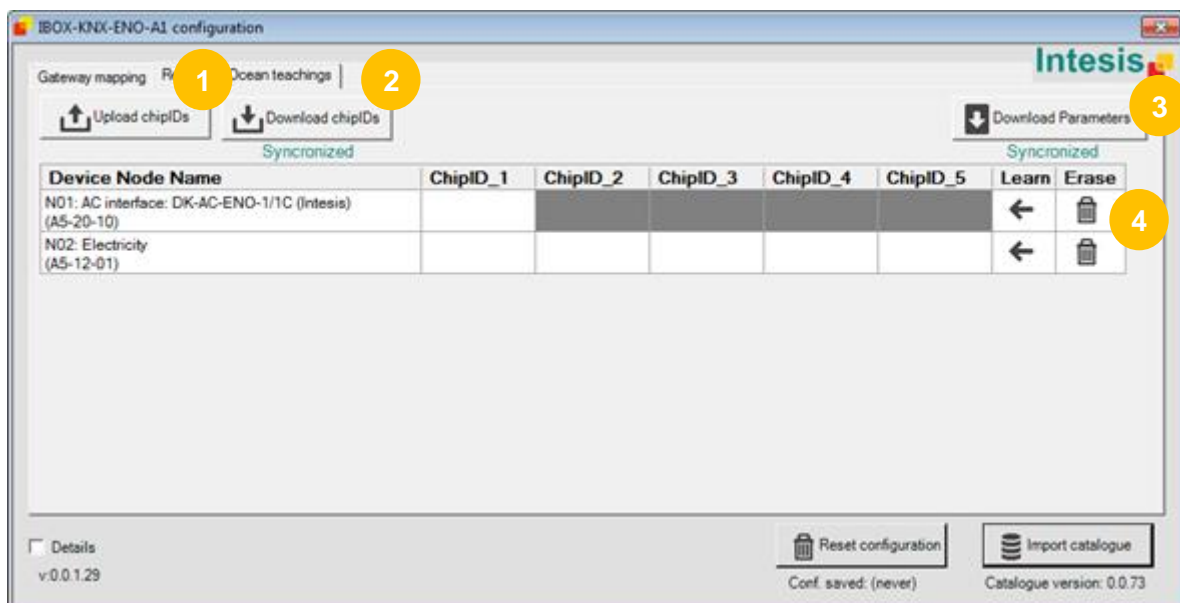


Figure 4.10 Remote EnOcean Teaching/Learning screen

- 1 Upload chipIDs:** When pressing this button, information regarding Chip IDs stored in the gateway is sent to the ETS plugin. A progress bar message will appear indicating the uploading status.

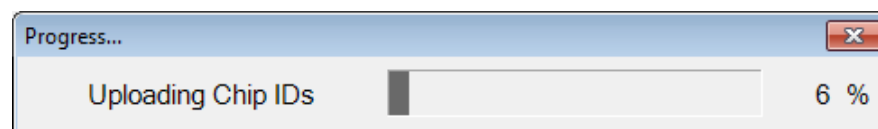


Figure 4.11 Uploading Chip ID

Once information is imported a finish message will pop-up, indicating successful results for the operation.

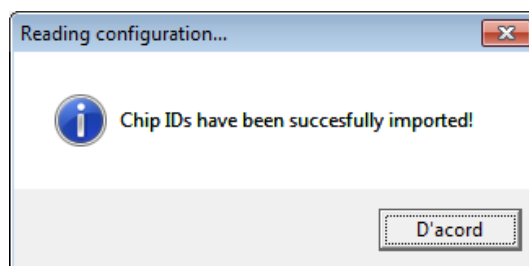


Figure 4.12 Confirmation message after Chip ID upload

This is an important step and it has to be performed every time a device (or devices) is (are) added or erased.

2

Download chipIDs: When pressing this button, information regarding Chip IDs stored in the ETS plugin is downloaded to the gateway. If gateway parameters were not synchronized, the plugin will ask the user to synchronize information at both sides before proceeding with Chip ID downloading.

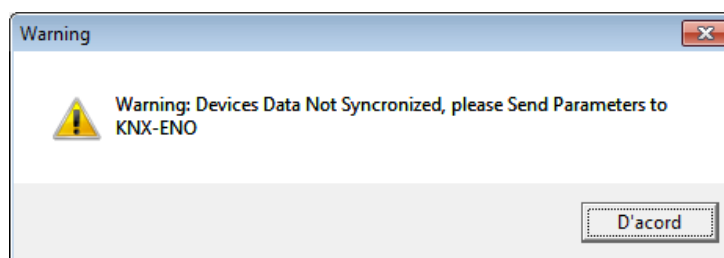


Figure 4.13 Devices data not synchronized message

Text below the button indicates whether information in the ETS has been synchronized or not with the information in the gateway. If information is not synchronized, text will appear red (see Figure 4.14) indicating there is no synchronism between plugin information and gateway information.

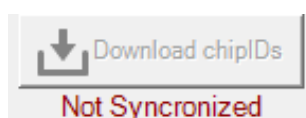


Figure 4.14 Chip IDs not synchronized message

As well as with the Upload chipIDs button, during downloading process a window will pop-up indicating the uploading status.



Figure 4.15 Downloading Chip ID

This is an important step and it has to be performed every time a device (or devices) is (are) added or erased.

- 3 Download parameters:** Before starting Uploading/Downloading Chip IDs, information on the gateway and the ETS should be synchronized. The text below the button will indicate if the system is synchronized or not.

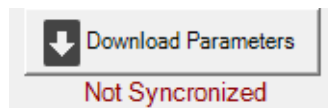


Figure 4.16 Parameters not synchronized message

In case it is not, please proceed to download parameters pressing the button. When doing so, the plugin will warn the user about the procedure, so previous configuration will be erased.

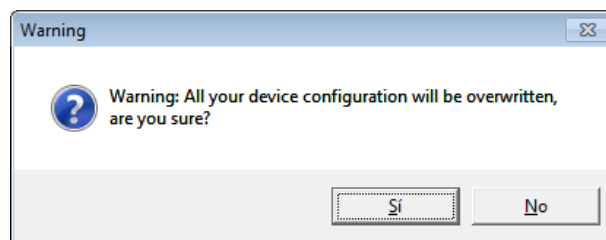


Figure 4.17 Warning message regarding overwriting previous configuration

This process lasts some seconds and when finished the added devices will be shown in the LCD KNX-ENO device display (press the up/down arrows to see them).

- 4 Device table:** In this table all devices integrated in the project will appear letting the user learn or erase Chip ID information from them. Basically, information shown is:

- **Device Node Name:** Provides information about the name of the node where the device is setup.
- **chipID_1-2-3-4-5:** Provides information about the Chip ID of the integrated (or simulated) EnOcean devices in each node. Up to 5 different devices can be added in a single node.
- **Learn:** When pressing this arrow, a countdown time starts in which you can press the teach button from your EnOcean device (the one that you want to integrate) so the gateway can learn the Chip ID.

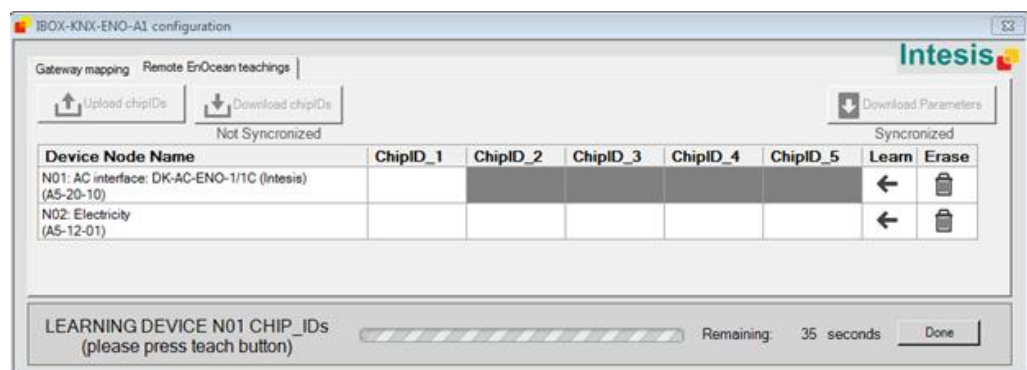


Figure 4.18 Learning process

If devices are learned before countdown reaches the end, you can press the **Done** button so the countdown stops.

- **Erase:** When pressing on the trash icon a new window will pop-up (see **Figure 4.19**). On this screen, user will see all Chip IDs from the associate node and will be able to delete each Chip ID individually. Remember to press the **Save changes** button before closing the window.

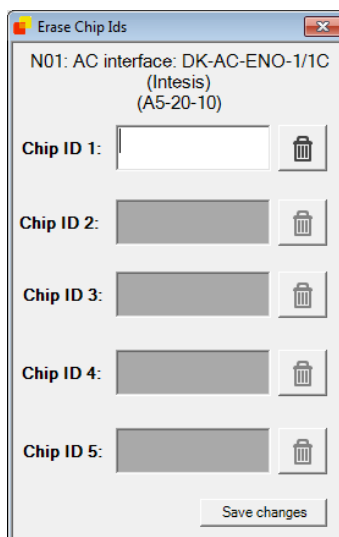


Figure 4.19 Erasing process

5. Device programming and monitoring buttons

IBOX-KNX-ENO-A1 includes programming buttons in case you want to program or monitor devices without the help of our ETS plugin. In Figure 4.1 you can see the available buttons and below you can find an explanation about them.

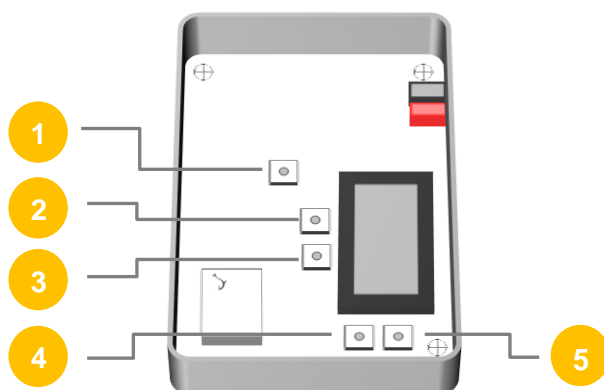


Figure 5.1 IBOX-KNX-ENO-A1 interior view

- 1 **KNX Prog Button:** Button used to program the KNX physical address into the gateway.
- 2 **Erase Button:** Button used to erase linked EnOcean devices.
- 3 **Learn/Teach button:** Button used to link and monitor EnOcean devices.
- 4 **Up arrow button:** Browse configured device list in an ascending way.
- 5 **Down arrow button:** Browse configured device list in a descending way.

More information about programming buttons and all functionalities available can be found in section 10.

5.1 Learn EnOcean devices

When pressing the **Learn/Teach** button an “L” appears on the right side of the LCD display. Then the gateway will be in “**Learn**” mode. In order to link an EnOcean device with the device appearing in the LCD display, click on the Learn/Teach button from the EnOcean device and it will be linked. It is possible to check that the device has been learned in the numeric indicator of the LCD display. *When learning IntesisBox gateways for AC, the process will last few seconds and meanwhile the “ongoing” text will be shown in the LCD.*

5.2 Erase EnOcean devices

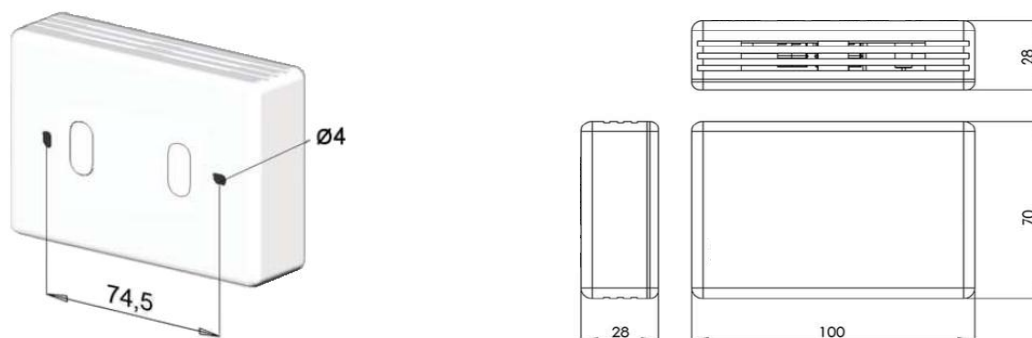
When pressing the **Erase** button an “E” appears on the right side of the LCD display. Then the gateway will be in “**Erase**” mode. To erase the desired EnOcean device, click on the de Learn/Teach button from the device and it will be erased. It is possible to check that the device has been erased in the numeric indicator of the LCD display. *If pressed long (more than 2 seconds) an option to erase the whole node will be shown (press “**Erase**” again to confirm).*

5.3 Monitor mode

If pressing the **Learn/Teach** button long (more than 2 seconds) the gateway will enter in Monitor Mode. In this mode is possible to check the signal quality from each EnOcean device linked.

To do so, simply enter to this mode, and press the **Learn/Teach** button from the EnOcean device you want to check. A value in % will appear in the LCD indicating the signal strength. Also the node and device number will be shown.

6. Technical Specifications



Enclosure	Material: ABS (UL 94 HB). 2,5 mm thickness Size: 70 x 100 x 28 mm Weight: 80g Color: White
Power supply	29V DC, 7mA Supplied through KNX bus.
Mounting	Wall.
LED indicators (internal)	1 x KNX programming.
LCD Display (internal)	2x8 Characters STN Positive (Yellow-green) Reflective type Without backlight
Push buttons	1 x KNX programming. 2 x LCD display control 1 x Erase EnOcean devices 1 x Teach / Learn EnOcean devices
Operating Temperature	From 0°C a 40°C
Operating humidity	<93% HR, no condensation
Stock humidity	<93% HR, no condensation
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	IBOX-KNX-ENO-A1: <ul style="list-style-type: none"> CE conformity to EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC) <ul style="list-style-type: none"> EN 301489-1 V1.8.1 EN 60950-1 EN 50491-3 EN 50090-2-2 IBOX-KNX-ENO-A1C: <ul style="list-style-type: none"> FCC (ID: SZV-STM300C) IC (ID: 5713A-STM300C)

7. Compatibility list

A list of EnOcean devices compatible with the IBOX-KNX-ENO-A1i and IBOX-KNX-ENO-A1iC and their available features can be found in:

http://www.intesis.com/pdf/IntesisBox_KNX-ENO-A1-C_Compatibility.pdf

8. Appendix A – EnOcean Family Communication Objects Tables ¹

9.1 AC interface

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
On/Off	Control_ On/Off	1 bit	DPT_Switch	1.001		W	T		0 - Off; 1-On
Mode	Control_ Mode	1 byte	DPT_HVACContrMode	20.105		W	T		0 - Auto; 1 - Heat; 3 - Cool; 9 - Fan; 14 - Dry
	Control_ Mode Auto	1 bit	DPT_Bool	1.002		W	T		1 - Auto
	Control_ Mode Heat	1 bit	DPT_Bool	1.002		W	T		1 - Heat
	Control_ Mode Cool	1 bit	DPT_Bool	1.002		W	T		1 - Cool
	Control_ Mode Fan	1 bit	DPT_Bool	1.002		W	T		1 - Fan
	Control_ Mode Dry	1 bit	DPT_Bool	1.002		W	T		1 - Dry
Fan Speed	Control_ Fan Speed / 14 Speeds	1 byte	DPT_Scaling	5.001		W	T		%
	Control_ Fan Speed / 14 Speeds	1 byte	DPT_Enumerated	5.010		W	T		1 - Speed 1; 2 - Speed 2; 3 Speed 3; ...; 14 Speed 14
	Control_ Fan Speed Manual/Auto	1 bit	DPT_Bool	1.002		W	T		0 - Manual; 1 - Auto
	Control_ Fan Speed 1	1 bit	DPT_Bool	1.002		W	T		1 - Fan Speed 1
	Control_ Fan Speed 2	1 bit	DPT_Bool	1.002		W	T		1 - Fan Speed 2
	Control_ Fan Speed 3	1 bit	DPT_Bool	1.002		W	T		1 - Fan Speed 3
	Control_ Fan Speed 4	1 bit	DPT_Bool	1.002		W	T		1 - Fan Speed 4
	Control_ Fan Speed 5	1 bit	DPT_Bool	1.002		W	T		1 - Fan Speed 5

¹ In case of a simulated EnOcean device, Control_ objects become Status_ objects and vice versa, except the Control_ and Status_ objects for AC interfaces.

Vanes	Control_ Vane Position	1 byte	DPT_Scaling	5.001		W	T	%
	Control_ Vane Position / 5 Positions	1 byte	DPT_Enumerated	5.010		W	T	1 - Position 1; 2 - Position 2; 3 Position 3; 4 - Position 4; 5 Position 5
	Control_ Vane Manual/Auto	1 bit	DPT_Bool	1.002		W	T	0 – Position 1; 1 - Auto
	Control_ Vane Position 1	1 bit	DPT_Bool	1.002		W	T	1 - Position 1
	Control_ Vane Position 2	1 bit	DPT_Bool	1.002		W	T	1 - Position 2
	Control_ Vane Position 3	1 bit	DPT_Bool	1.002		W	T	1 - Position 3
	Control_ Vane Position 4	1 bit	DPT_Bool	1.002		W	T	1 - Position 4
	Control_ Vane Position 5	1 bit	DPT_Bool	1.002		W	T	1 - Position 5
	Control_ Vane Swing	1 bit	DPT_Bool	1.002		W	T	0 – Position 1; 1 - Swing
Temperature	Control_ Setpoint	1 byte	DPT_Scaling	5.001		W	T	(°C)
	Control_ Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T	(°C)
	Control_ Temperature	2 bytes	DPT_Value_Temp	9.001		W	T	(°C)
	Control_ Ambient Temperature	2 bytes	DPT_Value_Temp	9.001		W	T	(°C)
Window	Control_ Window Contact	1 bit	DPT_OpenClose	1.009		W	T	0 - Open; 1 - Closed
	Control_ Window Contact	1 bit	DPT_Window_Door	1.019		W	T	0 - Closed; 1 - Open
External	Control_ External disablement	1 bit	DPT_Bool	1.002		W	T	0 - False; 1 - True
	Control_ External disablement	1 bit	DPT_Enable	1.003		W	T	0 - Disable; 1 - Enable
Locking	Control_ Disable Remote Control	1 bit	DPT_Bool	1.002		W	T	0 - False; 1 - True
	Control_ Disable Remote Control	1 bit	DPT_Enable	1.003		W	T	0 - Disable; 1 – Enable

On/Off	Status_ On/Off	1 bit	DPT_Switch	1.001	R	T	0 - Off; 1-On
	Status_ Mode	1 byte	DPT_HVACContrMode	20.105	R	T	0 - Auto; 1 - Heat; 3 - Cool; 9 - Fan; 14 - Dry
Mode	Status_ Mode Auto	1 bit	DPT_Bool	1.002	R	T	1 - Auto
	Status_ Mode Heat	1 bit	DPT_Bool	1.002	R	T	1 - Heat
	Status_ Mode Cool	1 bit	DPT_Bool	1.002	R	T	1 - Cool
	Status_ Mode Fan	1 bit	DPT_Bool	1.002	R	T	1 - Fan
	Status_ Mode Dry	1 bit	DPT_Bool	1.002	R	T	1 - Dry
	Status_ Fan Speed / 14 Speeds	1 byte	DPT_Scaling	5.001	R	T	%
	Status_ Fan Speed / 14 Speeds	1 byte	DPT_Enumerated	5.010	R	T	1 - Speed 1; 2 - Speed 2; 3 Speed 3; ...; 14 Speed 14
Fan Speed	Status_ Fan Speed Manual/Auto	1 bit	DPT_Bool	1.002	R	T	0 – Manual; 1 - Auto
	Status_ Fan Speed 1	1 bit	DPT_Bool	1.002	R	T	1 - Speed 1
	Status_ Fan Speed 2	1 bit	DPT_Bool	1.002	R	T	1 - Speed 2
	Status_ Fan Speed 3	1 bit	DPT_Bool	1.002	R	T	1 - Speed 3
	Status_ Fan Speed 4	1 bit	DPT_Bool	1.002	R	T	1 - Speed 4
	Status_ Fan Speed 5	1 bit	DPT_Bool	1.002	R	T	1 - Speed 5
	Status_ Vane Position	1 byte	DPT_Scaling	5.001	R	T	%
Vanes	Status_ Vane Position / 5 Positions	1 byte	DPT_Enumerated	5.010	R	T	1 - Position 1; 2 - Position 2; 3 Position 3; 4 - Position 4; 5 Position 5
	Status_ Vane Manual/Auto	1 bit	DPT_Bool	1.002	R	T	0 – Position 1; 1 - Auto
	Status_ Vane Position 1	1 bit	DPT_Bool	1.002	R	T	1 - Position 1
	Status_ Vane Position 2	1 bit	DPT_Bool	1.002	R	T	1 - Position 2
	Status_ Vane Position 3	1 bit	DPT_Bool	1.002	R	T	1 - Position 3

	Status_ Vane Position 3	1 bit	DPT_Bool	1.002	R	T	1 - Position 3
	Status_ Vane Position 4	1 bit	DPT_Bool	1.002	R	T	1 - Position 4
	Status_ Vane Position 5	1 bit	DPT_Bool	1.002	R	T	1 - Position 5
	Status_ Vane Swing	1 bit	DPT_Bool	1.002	R	T	0 – Position 1; 1 - Swing
Temperature	Status_ Setpoint	1 byte	DPT_Scaling	5.001	R	T	(°C)
	Status_ Setpoint	2 bytes	DPT_Value_Temp	9.001	R	T	(°C)
	Status_ Temperature	2 bytes	DPT_Value_Temp	9.001	R	T	(°C)
Alarm	Status_ Alarm State	1 bit	DPT_Alarm	1.005	R	T	0 – No alarm; 1 - Alarm
Error	Status_ Error code	2 bytes	DPT_Value_2_Ucount	7.001	R	T	AC error (0 - no error)
Window	Status_ Window Contact	1 bit	DPT_OpenClose	1.009	R	T	0 - Open; 1 - Closed
	Status_ Window Contact	1 bit	DPT_Window_Door	1.019	R	T	0 - Closed; 1 - Open
External	Status_ External disablement	1 bit	DPT_Bool	1.002	R	T	0 - False; 1 - True
	Status_ External disablement	1 bit	DPT_Enable	1.003	R	T	0 - Disable; 1 - Enable
Locking	Status_ Disable Remote Control	1 bit	DPT_Bool	1.002	R	T	0 - False; 1 - True
	Status_ Disable Remote Control	1 bit	DPT_Enable	1.003	R	T	0 - Disable; 1 – Enable

9.2 Automated Reading Meter

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Electricity	Status_Tariff Info	1 byte	DPT_Value_Temp	5.006	R		T		General
	Status_ Power kW	2 bytes	DPT_Power	9.024	R		T		
	Status_ Power W	4 bytes	DPT_Value_Power	14.056	R		T		Watts
	Status Active Energy	4 bytes	DPT_ActiveEnergy_kWh	13.013	R		T		KWh

9.3 Contact

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Status	Status_ Contact	1 bit	DPT_OpenClose	1.009	R		T		0 - Open; 1 - Closed
	Status_ Contact	1 bit	DPT_Window_Door	1.019	R		T		0 - Closed; 1 - Open

9.4 Key card

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Status	Status_Key Card Inserted	1 bit	DPT_Bool	1.002	R		T		0 – False; 1 - True

9.5 Light sensor

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Status	Status_Illumination 1	2 bytes	DPT_Value_Lux	9.004	R		T		lux
	Status_Illumination 2	2 bytes	DPT_Value_Lux	9.004	R		T		lux
	Status_Supply Voltage	2 bytes	DPT_Value_Volt	9.020	R		T		V

9.6 Light, Temperature and Occupancy sensors

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Voltage	Status_Supply Voltage	2 bytes	DPT_Value_Volt	9.020	R		T		mV
Illumination	Status_Illumination	2 bytes	DPT_Value_Lux	9.004	R		T		lx
Temperature	Status_Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C
Occupancy	Status_Occupancy PIR	1 bit	DPT_Occupancy	1.018	R		T		0 – Not occupied; 1 - Occupied
	Status_On/Off Button	1 bit	DPT_Switch	1.001	R		T		0 – Off; 1 - On
	Status_Occupancy Button	1 bit	DPT_Occupancy	1.001	R		T		0 – Not occupied; 1 - Occupied

9.7 Occupancy sensor

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Occupancy	Status_Occupancy	1 bit	DPT_Occupancy	1.018	R		T		0 – Not Occupied; 1 - Occupied

9.8 Rocker Switch

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Button	Status_ Button X ⁴ - Switching	1 bit	DPT_Switch	1.001	R		T		0 – Off; 1 - On
	Status_ Button X ⁴ - Dimming - On/Off	1 bit	DPT_Switch	1.001	R		T		0 – Off; 1 - On
	Status_ Button X ⁴ - Dimming – Step	4 bits	DPT_Control_Dimming	3.007	R		T		%
	Status_ Button X ⁴ – Shutter/Blind – Step	1 bit	DPT_ShutterBlinds_Mode	1.023	R		T		0 – Step Up; 1 – Step Down
	Status_ Button X ⁴ – Shutter/Blind - Move	1 bit	DPT_ShutterBlinds_Mode	1.023	R		T		0 – Move Up; 1 – Move Down
Channel	Status_ Channel Y ⁵ - Switching	1 bit	DPT_Switch	1.001	R		T		0 – Off; 1 - On
	Status_ Channel Y ⁵ - Dimming - On/Off	1 bit	DPT_Switch	1.001	R		T		0 – Off; 1 - On
	Status_ Channel Y ⁵ - Dimming – Step	4 bits	DPT_Control_Dimming	3.007	R		T		%
	Status_ Channel Y ⁵ – Shutter/Blind – Step	1 bit	DPT_ShutterBlinds_Mode	1.023	R		T		0 – Step Up; 1 – Step Down
	Status_ Channel Y ⁵ – Shutter/Blind - Move	1 bit	DPT_ShutterBlinds_Mode	1.023	R		T		0 – Move Up; 1 – Move Down

9.9 Temperature sensor

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Temperature	Status_Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C

⁴ X indicates the button index

⁵ Y indicates the channel index

9.10 Room Operating Panel

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Temperature	Status_Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	Status_Setpoint	1 byte	DPT_Scaling	5.001	R		T		%
	Status_Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
Switch	Status_Slide Switch	1 bit	DPT_Switch	1.001	R		T		0 – Off/Night/Pos1; 1 – On/Day/Pos0
Occupancy	Status_Occupancy Button	1 bit	DPT_Switch	1.001	R		T		0 – Off; 1 - On
Contact	Status_Contact State	1 bit	DPT_OpenClose	1.009	R		T		0 - Open; 1 - Closed
	Status_Contact State	1 bit	DPT_Window_Door	1.019	R		T		0 - Closed; 1 - Open
Fan Speed	Status_Fan Speed Manual/Auto	1 bit	DPT_Bool	1.002	R		T		0 – Manual; 1 - Auto
	Status_Fan Speed	1 byte	DPT_Scaling	5.001	R		T		%
	Status_Fan Speed	1 byte	DPT_Enumerated	5.010	R		T		1 - Position 1; 2 - Position 2; 3 Position 3;

9.11 Temperature and Humidity Sensor

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Humidity	Status_Humidity	2 bytes	DPT_Value_Humidity	9.007	R		T		%
Temperature	Status_Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C

9.12 Gas sensors

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Status	Status_ Concentration	2 bytes	DPT_AirQuality	9.008	R		T		ppm
	Status_ Concentration2	2 bytes	DPT_AirQuality	9.008	R		T		ppm
	Status_Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	Status_ Humidity	2 bytes	DPT_Value_Humidity	9.007	R		T		%

9.13 Window Handle

TOPIC	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
			DPT_NAME	DPT_ID	R	W	T	U	
Door	Status_ Window Door	1 bit	DPT_Window_Door	1.019	R		T		0 – Close, 1 - Open
Ventilation	Status_ Window Ventilation	1 bit	DPT_Bool	1.002	R		T		0 – False, 1 - True

9. Appendix A – EnOcean interoperability (EEP)

9.1 IntesisBox® supported EEPs

EEP	EEP ⁶ description
[F6-02-01]	Light and Blind Control – Application Style 1
[F6-02-02]	Light and Blind Control – Application Style 2
[F6-03-01]	Light and Blind Control – Application Style 1
[F6-03-02]	Light and Blind Control – Application Style 2
[F6-04-01]	Position Switch, Home and Office Application (Key Card Activated Switch)
[F6-10-00]	Mechanical Handle
[D5-00-01]	Contacts and Switches
[A5-02-xx]	Temperature sensors
[A5-04-01]	Temperature and Humidity Sensor
[A5-06-xx]	Light Sensor
[A5-07-xx]	Occupancy Sensor
[A5-08-xx]	Light, Temperature and Occupancy Sensor
[A5-09-xx]	Gas Sensor
[A5-10-xx]	Room Operating Panel
[A5-11-xx]	Controller Status

⁶ EnOcean Equipment Profiles (EEP) v2.1

[A5-12-00]	Automated meter Reading (AMR)
[A5-13-xx]	Environmental Applications
[A5-20-xx]	HVAC Components ⁷
[A5-30-xx]	Digital Input
[A5-37-xx]	Energy Management
[A5-38-xx]	Central Command

⁷ The gateway can replace the controllers of the HVAC Components, but not the EnOcean devices themselves.

10. Appendix B - IBOX-KNX-ENO-A1 HMI

