

# **IntesisBox<sup>®</sup>**

USB-ENO

v.1.0.0

USB-ENO-C

v.1.0.0

USB EnOcean gateway and repeater

**User's Manual**

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Gateway for integration of any EnOcean device in your USB enabled EnOcean compatible Controller or PC Software

2 models are available for this gateway, with the following **Order Codes**:

**USB-ENO**

EnOcean communication frequency: 868 MHz

**USB-ENO-C**

EnOcean communication frequency: 315 MHz

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## 1. Presentation



### **Integration of any EnOcean device in your USB enabled EnOcean compatible Controller or PC Software**

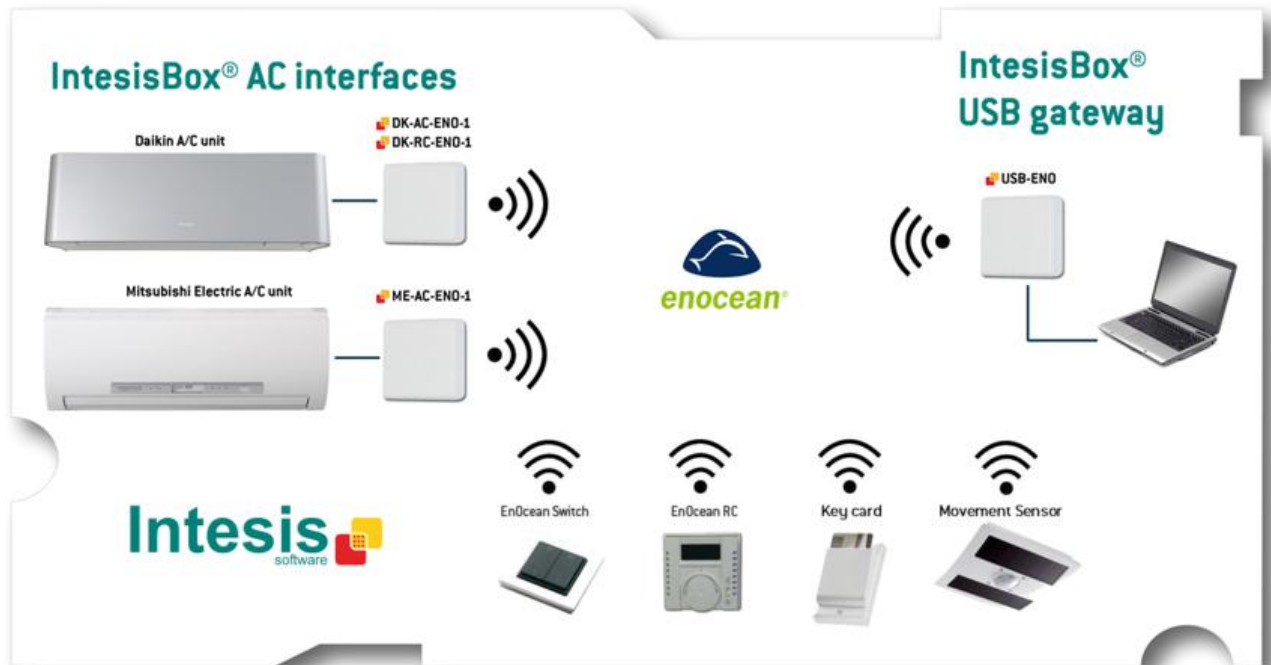
IntesisBox® USB-ENO / C gateways allow supervision and bidirectional control of any EnOcean device from PC systems such as SCADAs as well as any configuration and monitoring USB enabled systems.

### **1.1. Main Features:**

- Bidirectional: Supervision and Control.
- Unlimited transmitters supported.
- Up to 128 actuators.
- ESP2 and ESP3 communication compatible.
- Compatible with remote management telegrams
- 1 & 2 level repeater functionality available.
- USB Powered. No external power supply needed.
- Plug and Play (virtual COM port).
- Suitable look for home applications.
- Small dimensions.

## 1.2. Typical application

In Figure 1.1 it is shown a typical integration example using the USB-ENO / C to control and/or supervise IntesisBox® EnOcean AC Interfaces and many other devices.



**Figure 1.1** Integration example

## 2. Connection and placement

### 2.1. Connection

1. Plug the gateway to the USB port of the computer or control system.
2. The red USB LED (Figure 3.1) will turn on. Once the device has been recognized a virtual COM port is going to be generated and the LED will turn off.
3. To communicate with the gateway use this port.

### 2.2. Communication settings

The IntesisBox<sup>®</sup> USB-ENO / C can be configured to work with both ESP2 and ESP3. Detailed description of these protocols can be found in the EnOcean documentation. The following table is a summary of their properties and differences.

Description	ESP 2.0	ESP 3.0
Max. number of data types	7	255
Max. size of transferred data [bytes]	28	65535
Data verification	Checksum	CRC8
Communication speed [baud]	9600	57600

**Table 2.1** ESP2 and ESP3 main properties

### 2.3. Placement

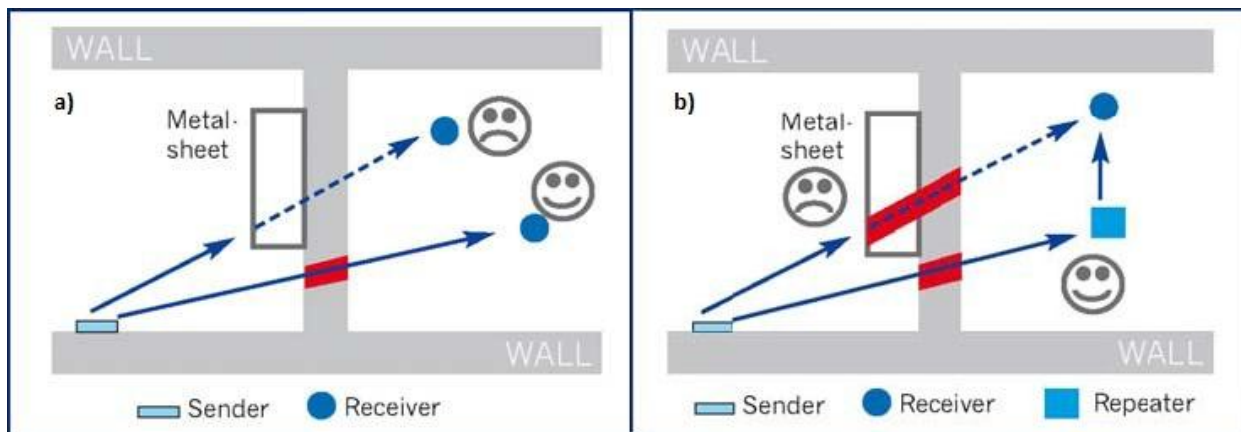
The coverage distance (see Table 2.2) of the signal emitted by the USB-ENO-/ C, or by any other EnOcean device, is determined by the room geometry and where they are placed. As an example, long narrow corridors with wide walls are an adverse situation. People or other obstacles can reduce the coverage distance too. Is therefore advice to always think in the worst possible scenario to decide the placement of the device to ensure a good stability in the radio system.

Conditions	Coverage distance
<b>Line-of-sight connections</b>	typically 30 m range in corridors up to 100 m in halls
<b>Plasterboard walls / dry wood</b>	typically 30 m range, through 5 walls
<b>Brick walls / aerated concrete</b>	typically 20 m range, through 3 walls
<b>Ferroconcrete walls / ceilings</b>	typically 10 m range, through 1 ceiling

**Table 2.2** Device coverage distance

#### 2.2.1 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 2.1a.



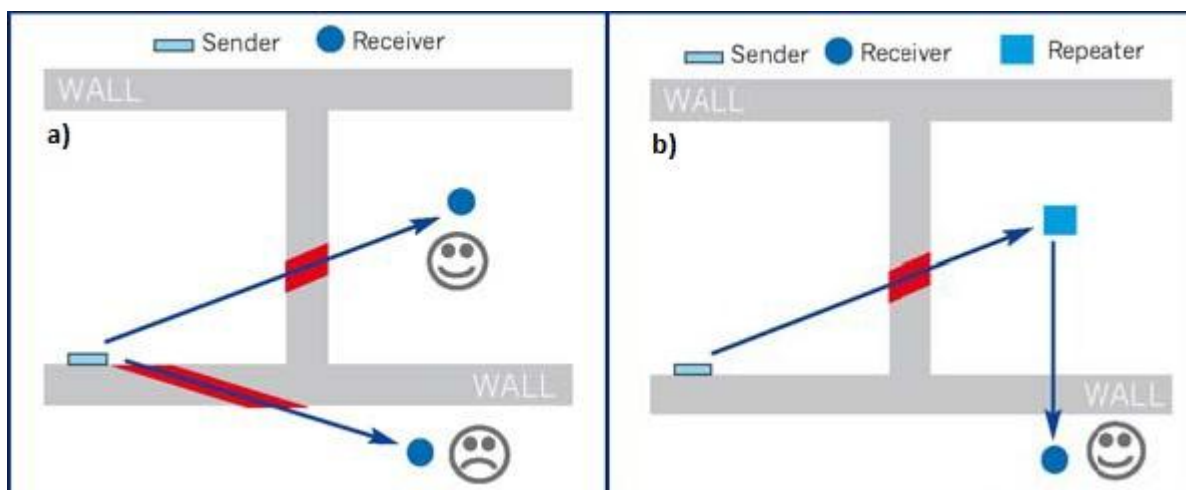
**Figure 2.1** a) Screening zone b) solution with a repeater

The situation of one of the receivers doesn't allow it to receive the transceiver telegrams. To solve this situation the use of a repeater outside the screening zone (Figure 2.1b) is recommended. The telegrams will be retransmitted from there to the receiver

### 2.2.2 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 2.2a 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 2.2b using a repeater in a different position



**Figure 2.2** Penetration angle

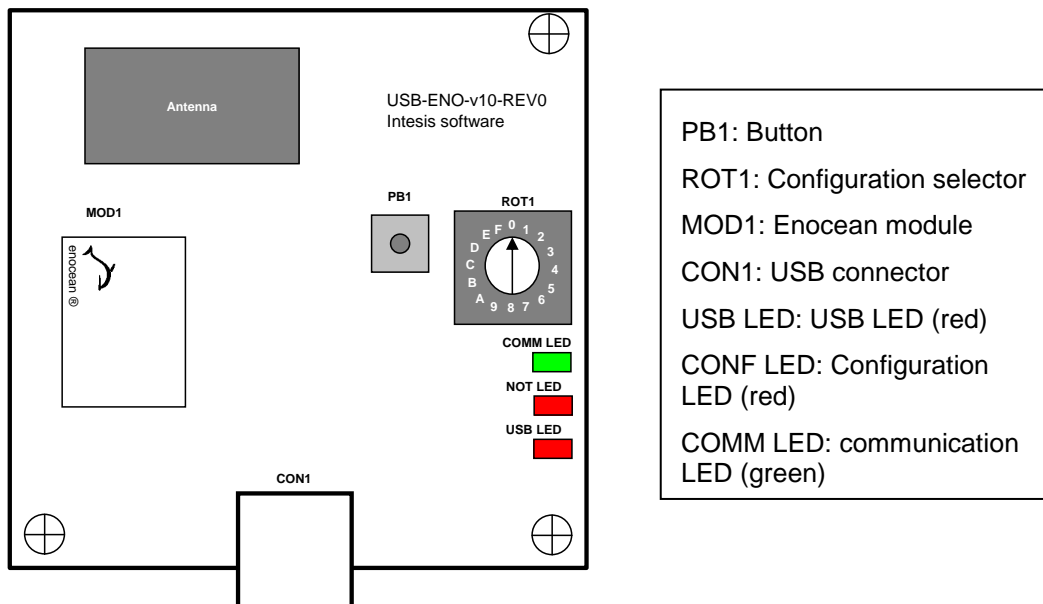


### 2.2.3 Use of repeaters

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. The USB-ENO / C can be configured to work as one (see section 3 for details).

### 3. Configuration

In Figure 3.1 a schematic of the device can be seen. This is useful to follow the instruction in section 3.1



**Figure 3.1** Device diagram

Two different configuration modes can be used: Manual or by commands (either using ESP2 or ESP3). Each way of configuring the gateway has different capabilities that can be seen in Table 3.1:

Parameter	ESP 2.0	ESP 3.0	Manual
BASE ID	Yes	Yes	No
Repeater mode	No	Yes	Yes
Protocol selection	No	No	Yes

**Table 3.1** Configuration modes

#### 3.1. Manual configuration

The manual configuration uses PB1 and ROT1 in Figure 3.1. Set the desired selector position in ROT1 (details in Table 3.2) and press the button PB1 during 5 seconds to execute the configuration order. Once the configuration is changed the CONF LED blinks as confirmation.

Parameter	ROT1 Selector position	Description
Repeater mode	<b>0</b>	<b>Repeater disabled (Default value)</b>
	1	1- Level repeater
	2	2- Level repeater
Protocol selection	<b>A</b>	<b>ESP 3.0 (Default value)</b>
	B	ESP 2.0

**Table 3.2** Selector position and behavior

### 3.2. Commands configuration

The commands to execute the supported functionalities explained in Table 3.1 are listed in the following table:

Operation	ESP2.0	ESP3.0
Set BASE ID	SET_BASEID	CO_WR_IDBASE
Read BASE ID	RD_BASEID	CO_RD_IDBASE
Get firmware version	RD_SW_VER	CO_RD_VERSION
Set repeater functionality	---	CO_WR_REPEATER
Get repeater functionality status	---	CO_RD_REPEATER

**Table 3.3** Configuration commands

More information about how to use this commands can be found in the documentation of communication protocols ESP2.0 and ESP3.0.

## 4. Technical data and dimensions

The main features of the devices USB-ENO / C are shown in Table 4.1. For further detail check the USB-ENO / C datasheet

Dimensions	71 x 71 x 27 mm
Weight	60 g
Operating Temperature	-25 . . . 85°C
Stock Temperature	-40 . . . 85°C
Operating Humidity	<93% HR, non-condensing
Stock Humidity	<93% HR, non-condensing
Power requirements	USB powered. USB limitations apply
EnOcean Frequencies	USB-ENO: 868 MHz USB-ENO-C: 315 MHz

**Table 4.1** Technical data

## 5. Regulations and standards

CE conformity:

R&TTE EU-directive on Radio and Telecommunications Terminal Equipment

The general registration for the radio operation is valid for all EU countries as well as for Switzerland.

Standards:

UNE-EN 50491-3:2010  
UNE-EN 60950-1:2007  
UNE-EN 61000-6-2:2006  
UNE-EN 61000-6-3:2007

FCC ID: SZV-STM300C  
IC: 5731A-STM300C

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications made to this equipment not expressly approved by Intesis Software may void the FCC authorization to operate this equipment.