FIRVENA

EnOcean to BACnet IP Gateway

EO-BAC-IP

868 MHz

User Manual V1.7

English

CONTENTS

TERMS AND ABBREVIATIONS

Term/Abbr.	Explanation
Channel number (CH)	Identifier of EnOcean device within the gateway
COV	Change of Value
DHCP	Dynamic Host Configuration Protocol
EEP	EnOcean Equipment Pofiles
EURID	EnOcean Unique Radio Identifier
Label	User-friendly name of EnOcean device
IP	Internet Protocol
PoE	Power over Ethernet
RX	Receive, reception
Teach-in	Pairing of EnOcean devices
Telegram	EnOcean message
TX	Transmit, transmission
UCOV	Unsubscribed COV
UPnP	Universal Plug and Play
Value index	Identifier of a data unit within the channel

THANK YOU

Thank you for purchasing our product! We believe in your satisfaction with the product that aligns with the company philosophy of the highest care and precision. In case of interesting ideas and concepts, please contact firvena@firvena.cz

www.firvena.com

1 INTRODUCTION

1.1 Description

The EO-BAC-IP device is a gateway between EnOcean and BACnet IP communication protocols. EnOcean and BACnet are a set of technologies and communication protocols that are widely used in building automation systems. The EnOcean is a technology that enables the use of wireless and battery-free sensors, switches and actuators. The BACnet is a communication protocol that was designed to provide unified interface for data exchange across a building management system. The EO-BAC-IP gateway can receive data from up to 40 EnOcean devices, store it and provide it through the BACnet IP interface to other devices connected to the BACnet network. It also allows bidirectional communication of EnOcean actuators such as switches, dimmers or heating valve controllers.

The first part of this manual describes the hardware of the gateway. Chapter 7 contains brief instructions for configuring the gateway, especially for connecting EnOcean devices. Chapter 8 describes the BACnet interface and explains how EnOcean devices are mapped to BACnet objects. For firmware update procedure refer to Chapter 9.
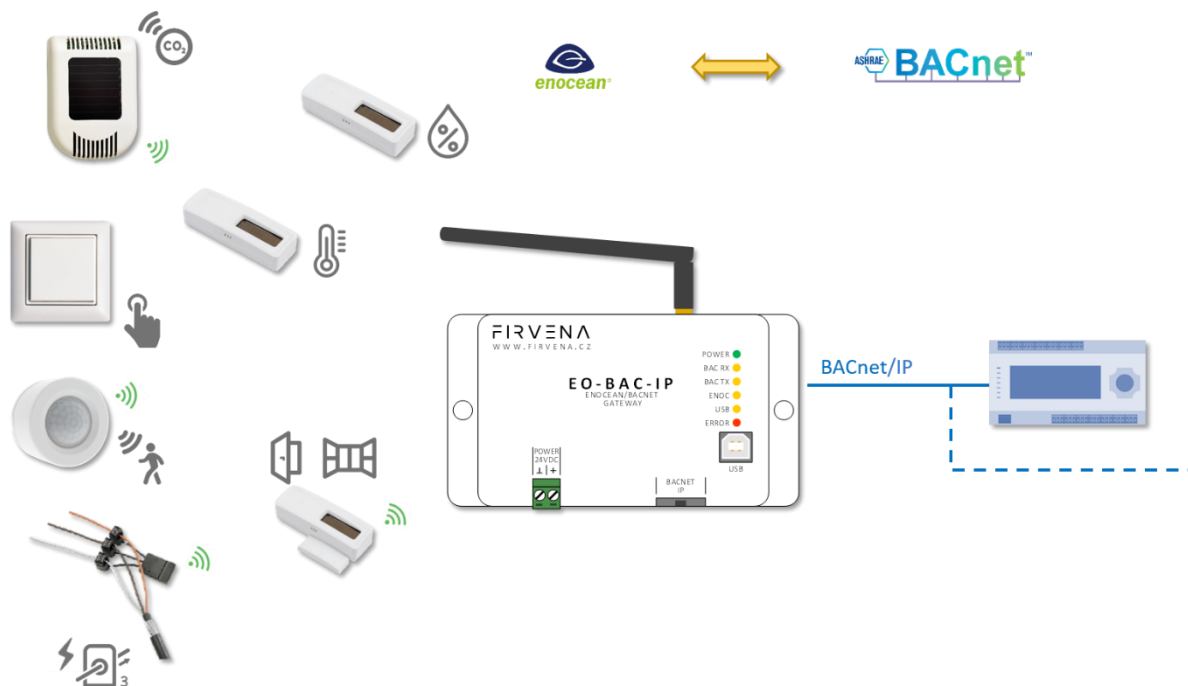
1.2 Installation instructions
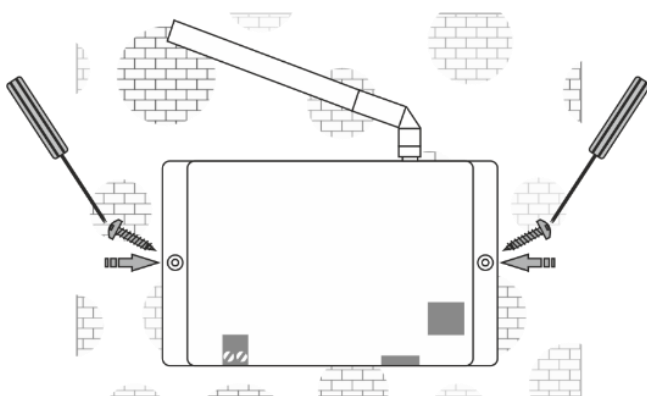
The gateway is fixed by using plastic anchors and Phillips screws to the wall or solid surfaces of suspended ceilings making sure that it is in a good radio position for receiving and transmitting signals. When located in shielded surfaces, the standard supplied antenna can be replaced with another permitted antenna type for the 868 MHz frequency with an SMA (Male) connector. External antenna with cable and magnetic base, type ANT-A1-SMA868-MAG2M is available at the manufacturer or distributor.

2 HARDWARE OVERVIEW

On the front panel, there are a power connector, RJ45 Ethernet connector, type B USB connector, antenna connector and LED indicators. The USB connector can be used for configuration and firmware update, and is also used by the *EO-BAC Tool* application. The green POWER terminal block is removable, making it easier to handle the device when cables are connected.

The LEDs indicate: the connection of power supply (POWER), activity in the BACnet network (BAC RX, BAC TX), activity in the EnOcean wireless network (ENOC), USB communication (USB) and error states (ERROR). The LEDs are very useful when testing or commissioning but because the emitted light can be disruptive during normal operation, the LEDs can be deactivated (Web UI > Settings > LED Indication).

There is a switch to the right of the POWER terminal block that is only accessible after pulling out the POWER terminal block. This is used to set the USB interface mode:
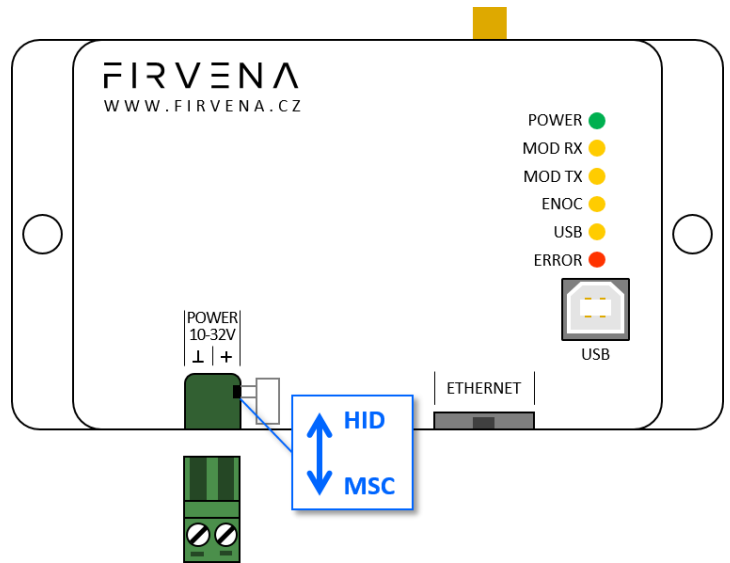
- **the "HID" position (default)** allows the connection of *EO-BAC Tool* application
- **the "MSC" position** allows access to filesystem

Case	LEDs		Behavior	Meaning
Power supply	POWER	🟢	Shining	Power supply connected and program running
DHCP	POWER	🟢	Goes off for 1 s	Network settings obtained from DHCP server
BACnet communication	BAC RX	🟡	Short blink	Communication in the BACnet network – received a packet
	BAC TX	🟡	Short blink	Communication in the BACnet network – sent a packet
EnOcean	ENOC	🟡	Short blink	EnOcean telegram received or sent
USB	USB	🟡	Flashing irregularly	Indicates communication through the USB port
–	ERROR	🔴	Flashing regularly	A fatal error has occurred, the device is about to restart

3 TECHNICAL DATA

Category	Parameter	Value
Product	Product name	EO-BAC-IP
	Product title	EnOcean to BACnet IP Gateway
	Product ID	11.1
	Vendor name	FIRVENA s.r.o.
Electrical data	Rated supply voltage	24 V DC / 24 V AC
	Supply voltage range	10–32 V DC / 24 V AC ($\pm$ 10 %)
	Rated input current	80 mA / 24 V
	Rated input power	1.92 W / 24 V; PoE Active 1.8 W
Ethernet (BACnet IP)	Speed	10, 100 Mbit/s
	Connector	RJ45
	PoE	✓
	PoE power supply	According to standard 802.3af, ACTIVE only
EnOcean	Frequency	868 MHz
	Maximum number of handled devices	40 (max. 20 with SmartACK)
	Repeater	✓
USB	Device class	Custom HID or Mass Storage
	Connector	Type B
Operating conditions	IP Code	IP20
	Operating temperature	-20 to $+70$ °C
	Relative humidity	max. 80 %
Dimensions in mm	Dimensions without antenna	Width=126, Height=71, Depth=25
Weight	Weight without antenna	115 g
Box material		ABS, white
Product conformity and certification		

✓RoHS	**ROHS Directive** The device is manufactured in accordance with the directive 2015/863/EU (RoHS 3) of the European Parliament and of the Council on the restriction of the use of certain hazardous	
CE	**EMC - Declaration of Conformity** The device is compliant with the directive 2014/53/EU, 2011/65/EU RoHS. Approvals tests ČSN EN 55032, ČSN EN 55035, ČSN EN 6100-4-2, ČSN EN 6100-4-3, ČSN EN 6100-4-4, ČSN EN 6100-4-5, ČSN EN 6100-4-6, ČSN EN 6100-4-11, ČSN EN IEC 6100-6-2.	
UKCA	**UK Conformity Assessed (UKCA)** The device is compliant with the British Legislation UK Conformity Assessed (UKCA) and meets all relevant requirements.	
enocean®	**EnOcean Technology** The device is fully compatible with the EnOcean radio protocol and as such is certified by the EnOcean Alliance Level 2.	

4 SAFETY INFORMATION AND WARNINGS

⚠ Please follow the general safety regulations. This device may only be installed by a qualified person (accredited electrician) and after reading these instructions. Improper installation can result in health, property or equipment damage.

The product meets the general safety regulations. The protection Cover IP 20 allows installation only in normal, dry space.

The gateway must be powered from a safe voltage source that meets the requirements for input voltage range and must be installed in accordance with national and general safety standards.

Follow the safety instructions and applicable standards for the country and location of installation. The product may only be used in accordance with this manual.

To avoid the risk of electrical shock or fire, the maximum operating parameters of the gateway must not be exceeded.

Use only unmodified products.

Only cable types with sufficient cross-section and insulation properties may be used for the connection.

STORAGE

The device must be stored in a temperature range 0-40 °C and a relative humidity of up to 80 %, and non-condensing spaces. Products must not be exposed shock, harmful vapors or gases.

REPAIRS

Products are repaired by the manufacturer. Products to be repaired are shipped in a package that ensures shock absorption and protects the products against damage during shipment.

WARRANTY

The product is warranted 24 months from the date of delivery that is mentioned on the delivery note. The manufacturer only guarantees properties and parameters that are explicitly described in the technical documentation. Claims, complaints and returns must be directed exclusively to the manufacturer. The complaint must contain the exact product identification, delivery note number and defects description. The manufacturer is not responsible for defects caused by improper storage, improper external connection, damages caused by external influences especially due to unacceptable size, incorrect adjustment, improper installation, incorrect operation or normal wear and tear.

PRODUCT DISPOSAL

🗑 The product does not belong to municipal waste. The product must be disposed to the separate waste collection with the possibility of recycling, according to local regulations and legislation. The product contains electronic components.

5 DIMENSIONS (IN MM)
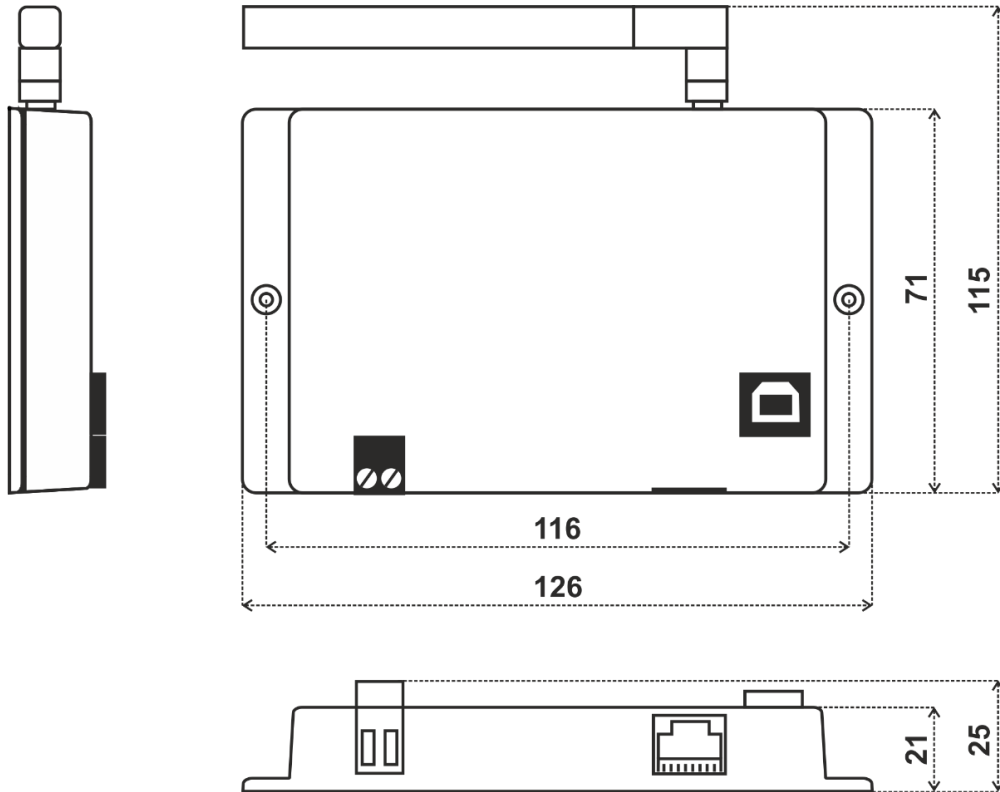
6 POWER SUPPLY

There are two possible power supply connections:

1. Power supply via PoE (Power over Ethernet):

The device supports PoE according to the 802.3af standard. Network elements must support this type of power interface. Passive PoE is not possible through the ETHERNET input. For passive PoE power supply, we recommend to use an appropriate splitter cable with connection to the POWER input.
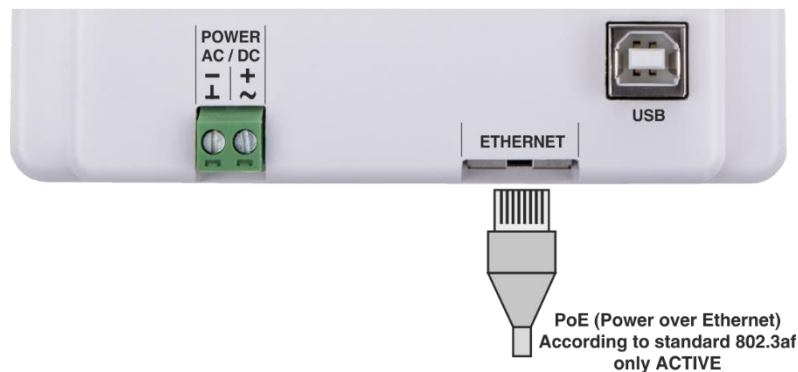
2. Power supply from an external source:

The gateway must be powered from a safe voltage source that meets input voltage range requirements. The electrical installation must be in accordance with national requirements and safety standards.
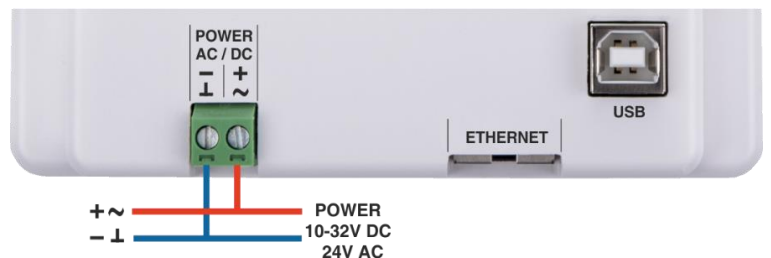
7 CONFIGURATION

The gateway has an integrated web application (*Web UI*) that serves to configure it using a web browser. Alternatively, a desktop application *EO-BAC Tool* is available at www.firvena.com, -> SUPPORT/DOWNLOAD/EO-BAC-IP/APPLICATION, it requires USB connection to the gateway and Windows 7 or higher. The use of *EO-BAC Tool* becomes necessary, among other things, if the password to *Web UI* has been forgotten. The following part describes how to open *Web UI* for the first time.

7.1 Accessing Web Interface

The IP address factory setting is:

PARAMETER	VALUE
IP address	192.168.1.90
Subnet mask	255.255.255.0
Default gateway	192.168.1.1
DHCP	enabled

Switch on the gateway and connect it to a local network via the ETHERNET connector or directly to a computer with an Ethernet adapter. The DHCP client is enabled by default, so the gateway automatically obtains the IP address and other network parameters from a DHCP server if available. The gateway signals DHCP success by shortly turning off the green POWER light.

If the configuration via DHCP fails, because there is no DHCP server in the network or you connect the gateway directly to a computer, the default network configuration is used after 10 seconds. In this case, change Ethernet adapter settings so that your computer has the same subnet mask and a different IP address, e.g. 192.168.1.95.
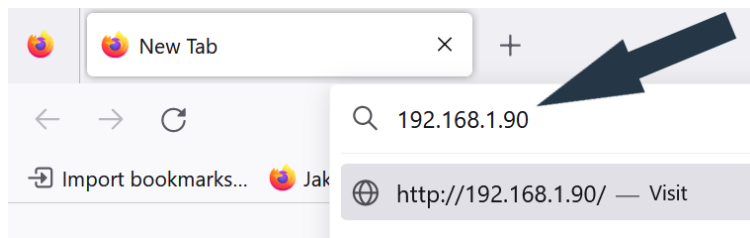
The *Web UI* is available on HTTP port 80, if you know the IP address of the gateway, simply enter "*http://<IP Address>*" into the address bar of your web browser (e.g. *http://192.168.1.90*).

The main page opens in "view-only mode". Login is required for other pages and configuration changes. The default password is **"123",** you can change it in [Settings > Change Password]. If the password is lost, you need to perform a factory reset using the *EO-BAC Tool*.
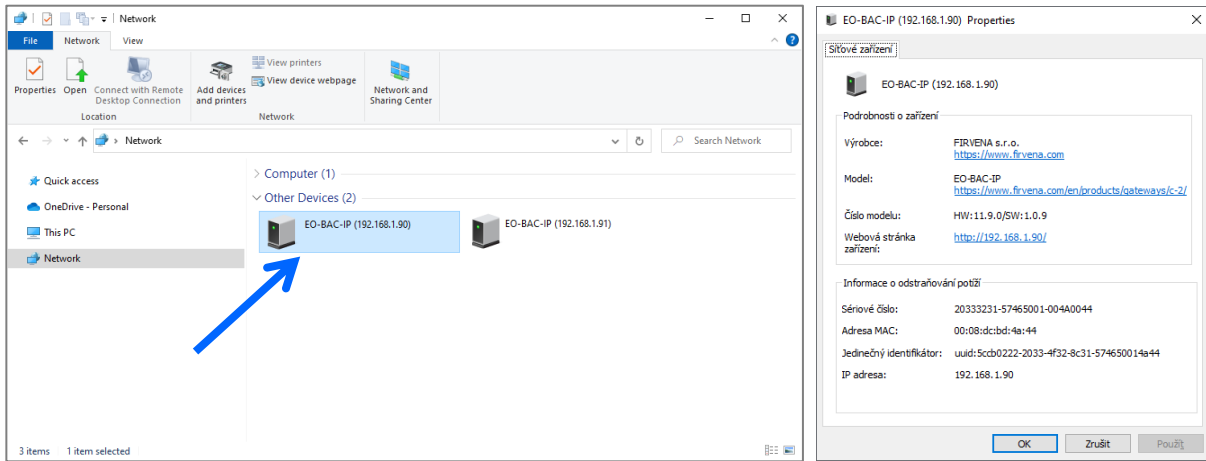

There are several **options** to find out the currently valid IP of the gateway:
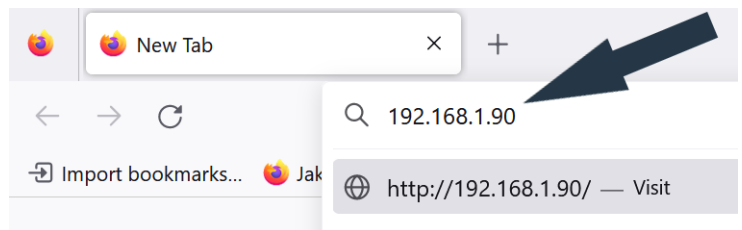
1. Network Discovery using UPnP

This method is recommended when using the Microsoft Windows operating system and UPnP messages are allowed in the network to which the gateway is connected.

Open the *Network* item in the *File Explorer*:

The gateway is under the group *"Other Devices"*. The description and IP address of the gateway are shown. Double click on the device item to open the *Web UI*. [Right click > Properties] will display additional information.

If the gateway is not shown, try to refresh the list:
[Click on the list > press F5 key] or [Right click > Refresh].

2. Network Discovery using BACnet

IP address can also be determined using any BACnet explorer (e.g. [6]). The default instance number of the Device object is 1001:

To access the *Web UI*, enter the IP address to the address bar of your web browser.
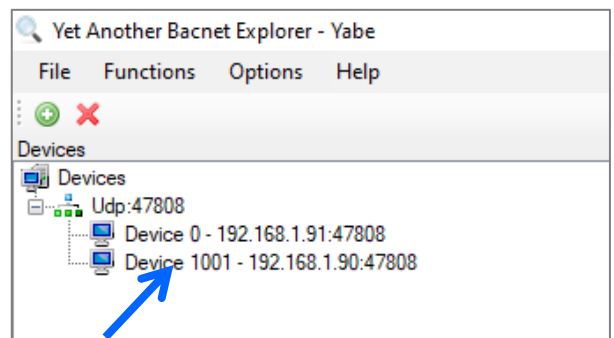
3. Using EO-BAC Tool

In the *USB HID* mode (see Ch. 2), the gateway presents itself as a Custom HID USB device. Connect the gateway to your computer using USB and use the *EO-BAC Tool*.

4. USB MSC

In the *USB MSC* mode (see Ch. 2), the gateway presents itself as an external USB drive. Connect the gateway to your computer using USB.

Find a file named NETINFO.TXT in the root directory and open it. The file contains the current IP address. To access the *Web UI*, enter the IP address to the address bar of your web browser.
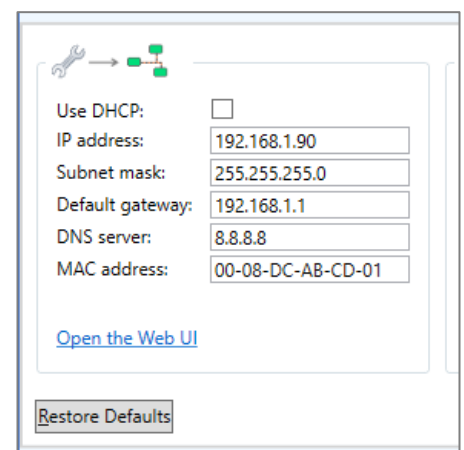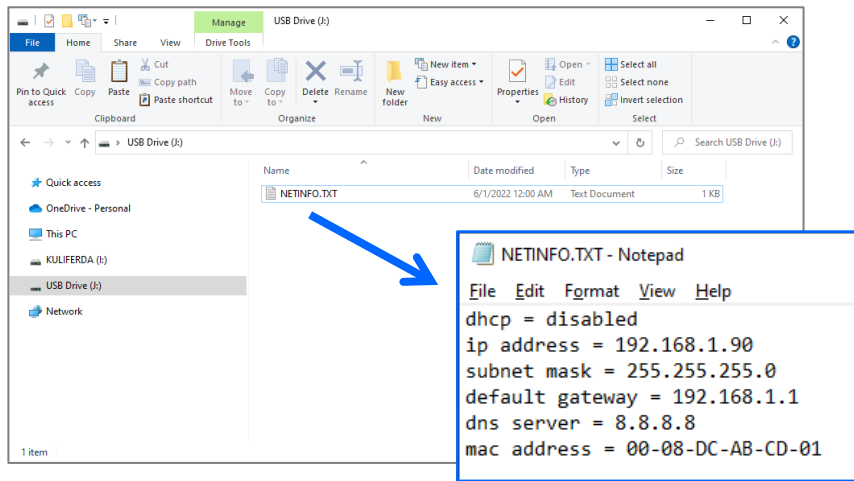
5. DHCP server

If you have access to the local DHCP server (usually through the configuration interface of your router), the IP address should be in DHCP clients list, look for the host name *"EO-BAC-IP_XXXXXX"*. To access the *Web UI*, enter the IP address to the address bar of your web browser.

7.2   Web UI

This chapter is a brief guide to the use of the *Web UI* application.

The *Web UI* is used to configure the gateway. The main purpose of the application is to manage EnOcean devices connected to the gateway. The application is also a useful verification tool whereby you can evaluate whether your system works well. It allows to see the states, measured quantities, communication intervals or signal strength of the connected EnOcean devices.

7.2.1   Main Page Overview

1. Dashboard – overview of configured channels
2. Toggles dashboard view:
   - Detailed – more information, only configured channels are displayed
   - Condensed – less information, both configured and empty channels are displayed
3. Menu items:
   - Add new device
   - Settings
   - Telegram log
4. Login button:
   - Locked – configuration locked and cannot be changed, only dashboard is accessible
   - Unlocked – configuration of the gateway can be changed
5. Gateway identification

The main page is accessible without a password. The default password is "123", you can change it in [Settings > Change Password].
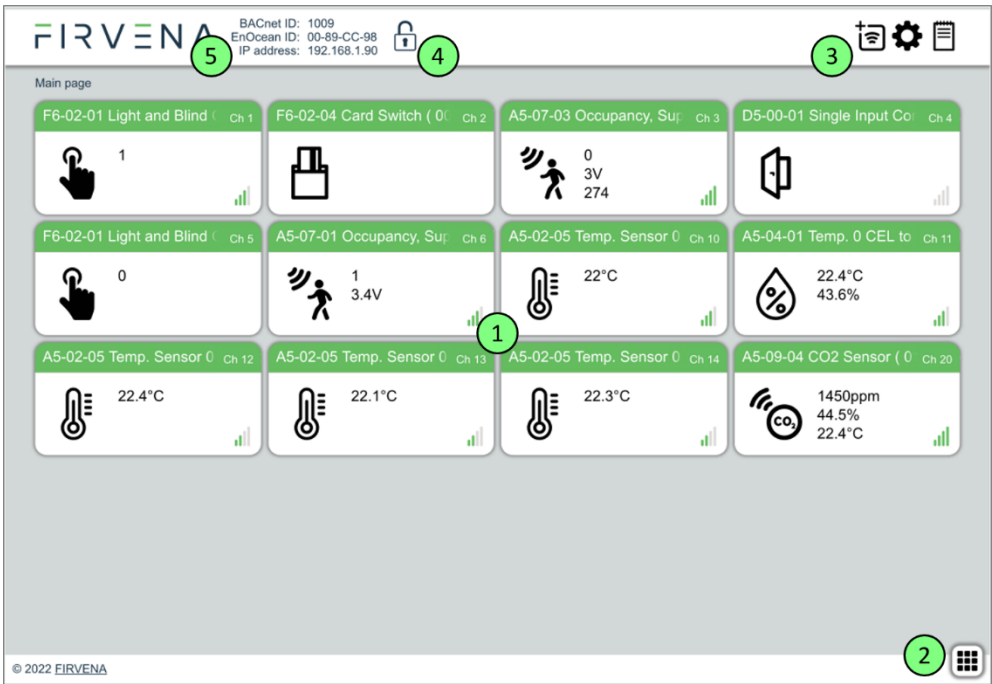
7.2.2   Assigning EnOcean elements – unidirectional

This teach-in procedure is only applicable for unidirectional communication when the gateway only receives data.

Let's have a humidity sensor (A5-04-01) we want to assign to the channel 1.

The procedure is as follows:

1. Click the "Add new" icon, a dialog box appears.
2. Push the pairing button to transmit a teach-in telegram.
3. The received telegram is displayed in the dialog box.
4. Select the channel number 1.
5. Click "Save" to confirm changes
6. Now the sensor is assigned to channel 1 and its data is available through the BACnet interface.
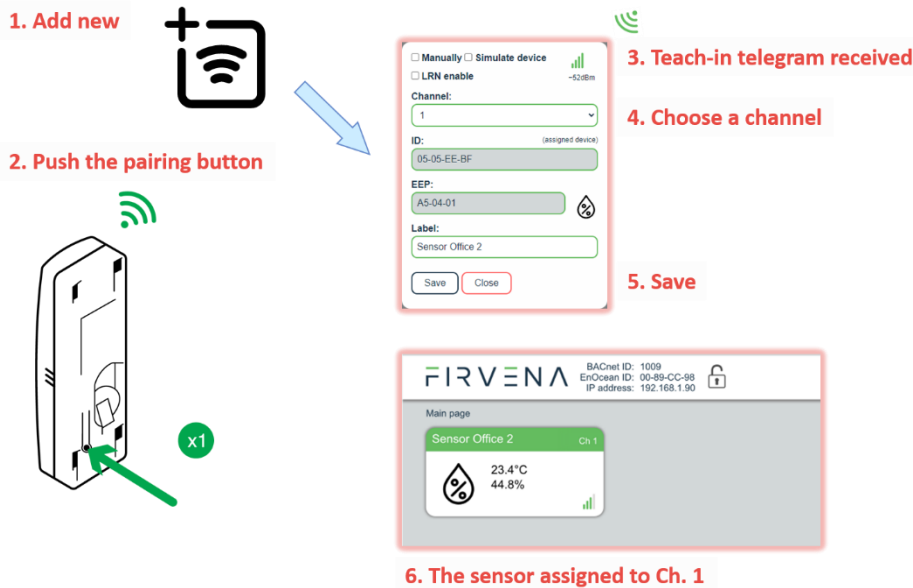
Optionally, the *Label* can be set for the device. The *Label* is used in the description property of the objects MSV 199-4099. If the *Label* field is left empty, the default text will be used.

The knowledge of EEP allows the gateway to interpret the received data correctly. Some types of EnOcean devices do not provide the EEP information in their teach-in telegram or even not have a special telegram for teach-in (e.g. buttons and switches). In that case, the EEP must be set manually, it is usually given by a label on the device or a datasheet.

Devices can also by assigned manually by entering the ID and EEP.

1. Add new

4. Fill in the ID and EEP

2. Check Manually

3. Choose a channel

5. Save

6. The sensor assigned to Ch. 1
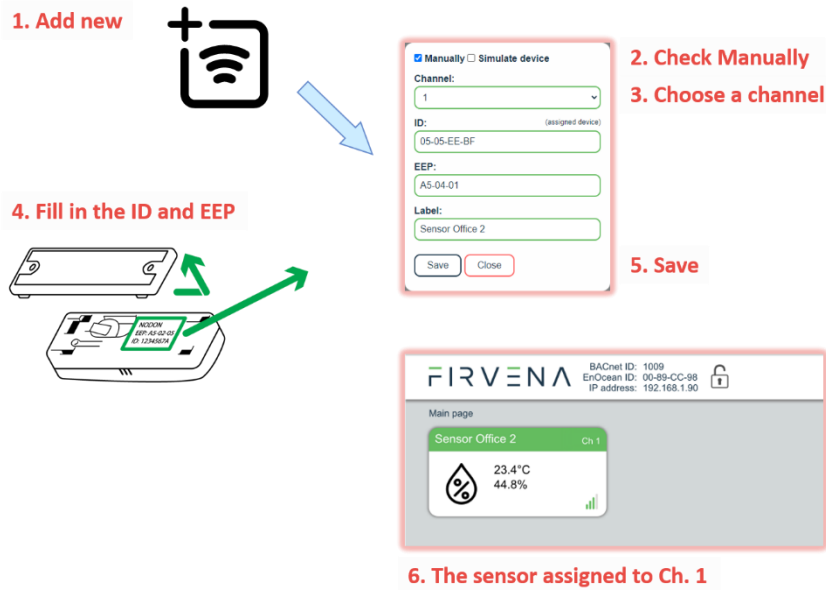
Click on the channel box to view more settings and status information:
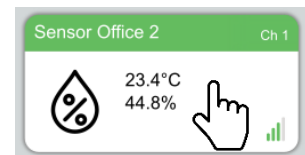
7.2.3 Assigning EnOcean elements – bidirectional

This teach-in procedure is applicable for EnOcean devices with bidirectional communication profiles when the gateway is supposed to receive data from the device and also transmit data to the assigned device.

Let's have a valve actuator (A5-20-01) we want to assign to the channel 1. The procedure is as follows:

1. Click the "Add new" icon, a dialog box appears.
2. Check "LRN enable"
3. Select the channel number 1.

Channel 1 is now in the teach-in mode.

4. Push the pairing button to transmit a teach-in telegram from the actuator.
5. Gateway receives the telegram and sends a teach-in response.
6. The device is automatically saved to the selected channel and its data is available through the BACnet interface.

To change the Label, enter the new text and click "Save".

Notes:
- *The device being assigned usually signals successful teach-in, e.g. by flashing LED. If it signals an error, the teach-in must be repeated.*

1. Add new

2. Check LRN enable

5. Teach-in telegram received and response sent

3. Choose a channel

4. Push the pairing button

6. The actuator assigned to Ch. 1
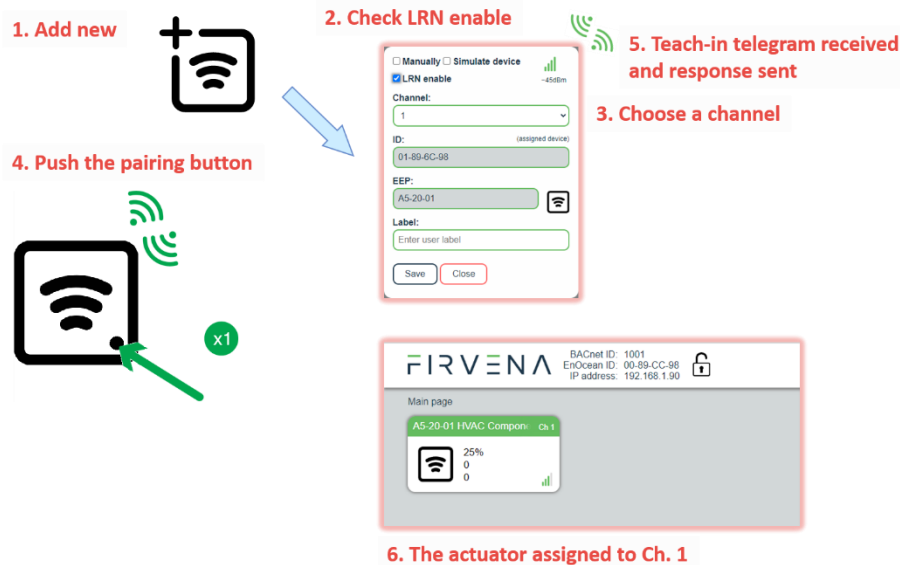
7.2.4 Assigning Smart ACK devices

To assign a Smart ACK device to the gateway, the procedure is the same as for bidirectional profiles (7.2.3). Repeaters are not supported, there must be a direct connection between the gateway and the Smart ACK device.

7.2.5 Definition of Virtual Device

The gateway can be used to simulate a real EnOcean device. This function is necessary when controlling actuators that do not implement any bidirectional profile, typically some types of relay switches.

For example, we want to control a relay switch that supports reception of a Door/Window Contact D5-00-01. The procedure is as follows.

First, define a virtual device of type D5-00-01, for example at channel 1:

1. Click the "Add new" icon, a dialog box appears.
2. Check "Simulate device"
3. Select a channel number (channel 1)
4. Select the type of device (D5-00-01)
5. Click "Save" to confirm changes
6. The device is saved to the selected channel and its data is available through the BACnet interface.
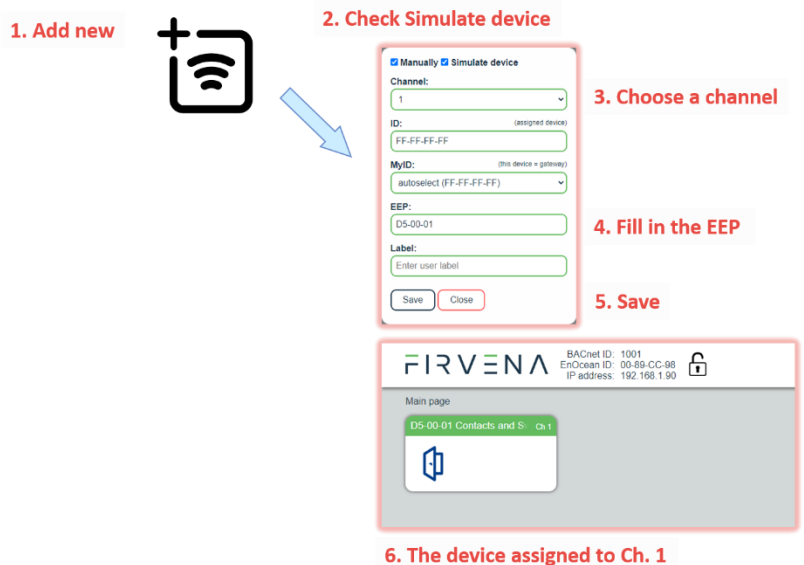
Second, pair the virtual device with the relay switch:

1. Click on the channel 1 box to see channel details
2. Put the relay switch to the pairing mode (follow the procedure given by the manufacturer of the switch)
3. In channel details click on the "Send LRN" button
4. The gateway will transmit a teach-in telegram of the virtual device
5. The switch will receive the teach-in telegram and save the virtual device

1. Add new

2. Check Simulate device

3. Choose a channel

4. Fill in the EEP

5. Save

6. The device assigned to Ch. 1

Third, test the connection:

1. Navigate to [Edit channel > Values]
2. Set the data to be transmitted (0:closed or 1:open)
3. Use "Send Now" to transmit a data telegram

Notes:
- *Each virtual device must have a unique ID, This is given by the MyID setting.*
- *To enable receiving the actual state of the switch, assign it to a different channel.*
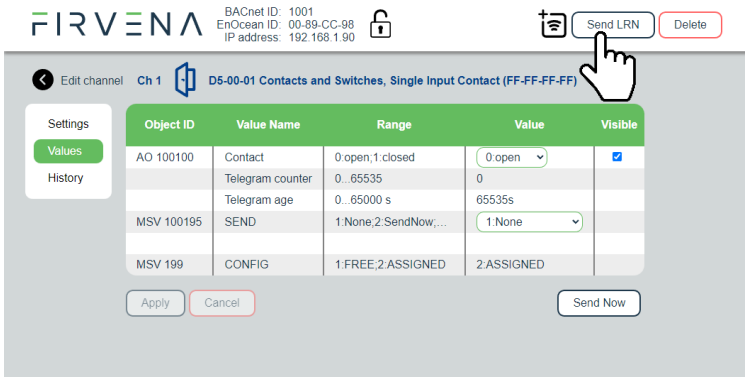
7.2.6 Channel Details

When you click on the channel box, the "Edit channel" view is shown. There are three tabs:

1. Settings – configuration of the channel
2. Values – actual data of the assigned device
3. BACnet – settings related to the BACnet interfaces
4. History – short history of the first three RX values

In the channel box, the first three RX values are displayed. To view all actual data of the assigned device, open the "Values" tab. Here you can find:

1. Object ID of the corresponding BACnet objects
2. Value name and range info
3. Actual data

For bidirectional EEPs and virtual devices, TX data can also be entered and sent using this view.
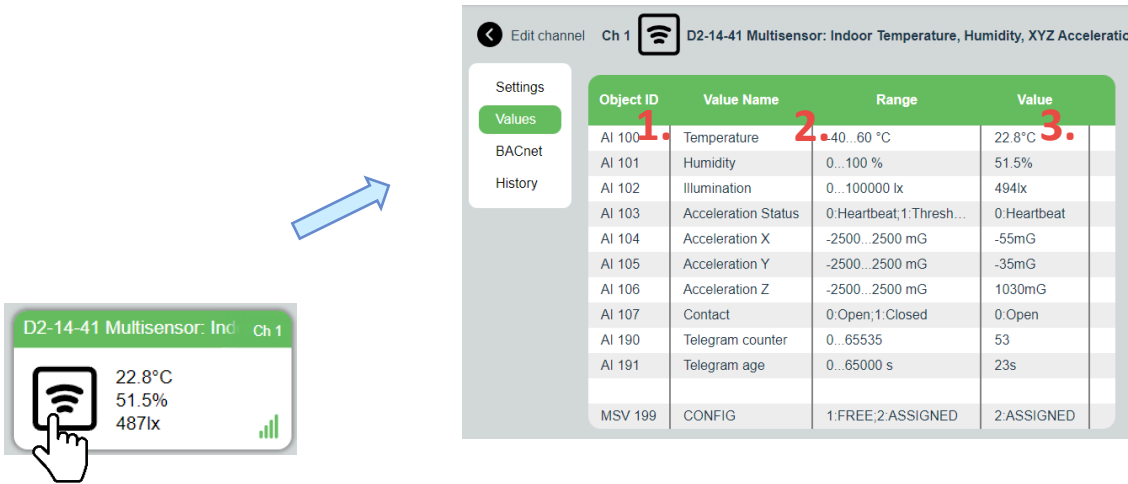
In the "BACnet" tab, you can change these settings:

1. Object Visibility – if unchecked, the object does not appear in the BACnet interface. Unused values can be hidden by this setting to reduce the number of exposed objects.
2. UCOV Enabled – enables the UCOV reporting for the object (see Ch. 8.4)
3. COV_Increment – configures the COV Increment property of the object
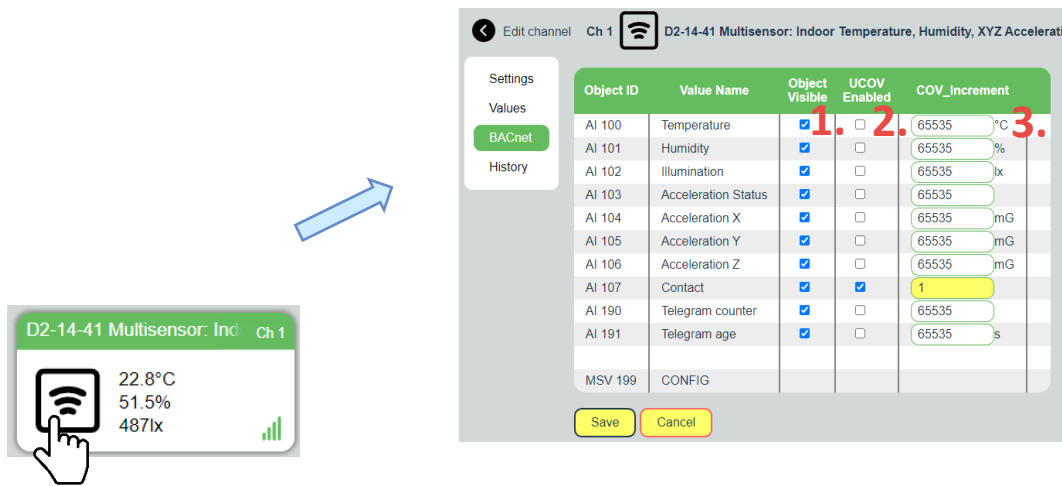
7.2.7   Removing EnOcean elements

1. Click on a channel box.
2. Click on the "Delete" button.

To remove all elements, use [Settings > Factory Reset > Reset Channels].

7.2.8   Backup and Restore

The configuration of the gateway can be exported to a file for later recovery or reuse. The backup file is compatible with the file used by *EO-BAC Tool* application.

To back up the configuration:

1. Navigate to [Settings > Backup and Restore].
2. Click on Download.
3. A file named config.json is downloaded.

To restore the configuration:

1. Navigate to [Settings > Backup and Restore].
2. Select a file or drag it to the dashed rectangle.
3. Click on Upload.

Notes:
- *Only channels are restored, the "Gateway Settings" are preserved.*

7.3 Steps – How to …

7.3.1 Enable EnOcean Repeater

The repeater mode is changed in [Web UI > Settings > EnOcean].

It can also be changed through BACnet object **MSV 2 (REPEATER_MODE).**

If turned on, the gateway forwards received telegrams in the EnOcean network.

Value	Meaning
1 – OFF (default)	Off
2 – LEVEL1	Level 1 (only original telegrams)
3 – LEVEL2	Level 2 (original and once repeated telegrams)
Value	Meaning

Level 1 – forwards only original (unrepeated) telegrams

Level 2 – forwards both original and once repeated telegrams

8 BACNET INTERFACE

8.1 Mapping of EnOcean Devices

EnOcean devices are mapped as a set of standard BACnet objects. The gateway can handle up to 40 EnOcean devices. To assign an EnOcean device, the teach-in procedure has to be carried out (see Ch. 7.2). The assigned EnOcean devices are identified by *Channel* (CH1…40) within the gateway, the *Channel* is selected by user during teach-in procedure.

Data fields received in a telegram are divided into individual standard BACnet objects so that they can be accessed from the BACnet network. The gateway contains a database of supported EnOcean products, objects are created depending on the type of EnOcean device (EEP) that is assigned to the channel during teach-in procedure.
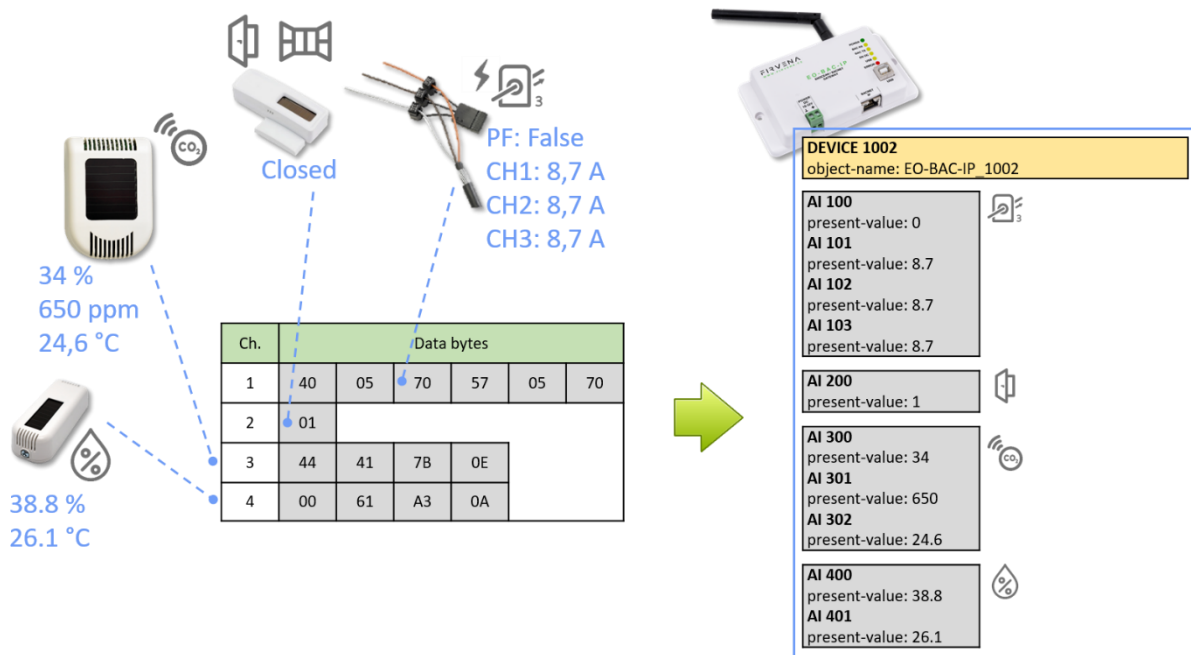
Three types of data fields are distinguished:

- **Numeric value:** usually a measured physical quantity such as temperature, humidity, etc.
- **Enumeration:** defined as a list of items that express a state or configuration of the device
- **Boolean:** two-state enumeration whose items can be interpreted as true/false, such as on/off, enabled/disabled, open/closed, etc.

In addition, two directions are distinguished:

- **RX:** data received by the gateway (incoming telegrams)
- **TX:** data transmitted by the gateway (outgoing telegrams)

The data fields are stored internally as *Values*. The *Values* are identified by *Value index*, 100 *Values* is reserved per channel (indexes 0 to 99):
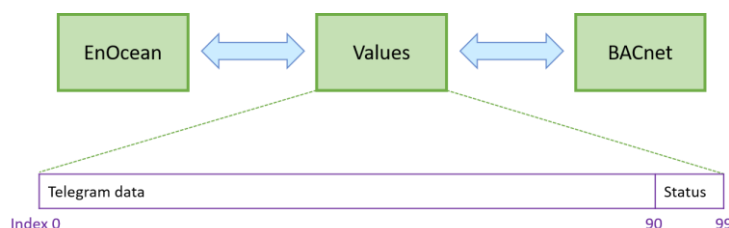
The *Values* from *Telegram data* range represent a model of EnOcean telegram. For simple devices (such as sensors with unidirectional communication) the model of telegram can also be assumed to be a model of EnOcean device. Some more complex EEP definitions consist of several types of telegrams that represent different commands, so the device cannot be described by a single telegram. Special mapping is created for these devices.

For direction "RX", all used *Values* are mapped to *Analog Input (AI)* objects. For direction "TX" all used *Values* are mapped to *Analog output (AO)* objects.

The object *Instance_Number* (part of O*bject_Identifier* property) is composed of the *Channel number* and *Value index*. Hundreds contain the *Channel number* of EnOcean device (Channel 1…40) that the BACnet object belongs to. Units contain the *Value index* that identifies a data field (Value 0…99):

AI 3704

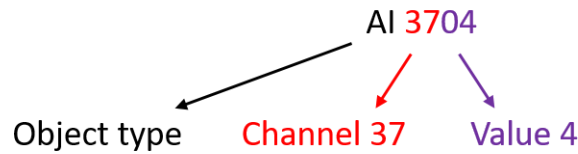Object type   Channel 37   Value 4

The mapped data fields from EnOcean telegram are indexed in the same order as they appear in the EEP definition – see [3].

Besides the data values, there are also helper values for each channel that provide status information. If the channel is not occupied, the associated BACnet objects are hidden.

Index	Name	Meaning	Value Range
90	Telegram counter	Number of received/sent telegrams	0…65535 (overflows to zero)
91	Telegram age	Time elapsed since the last telegram	0…65000 s (65535: no telegram, 65001: range exceeded)

The table below shows mapping examples for individual EnOcean devices, more examples are also in ANNEX A.

		AI		
CH1	Value 0	100	Temperature	A5-02-05 Temperature Sensors, Temperature Sensor Range 0°C to +40°C
	Value 1	101		
	Value 2	102		
	Value 3	103		
	Value 4	104		
	…	…	…	
	Value 90	190	T. Counter	
	Value 91	191	T. Age	
CH2	Value 0	200	Humidity	A5-09-04 Gas Sensor, CO2 Sensor
	Value 1	201	Concentration	
	Value 2	202	Temperature	
	Value 3	203	H-Sensor	
	Value 4	204	T-Sensor	
	…	…	…	
	Value 90	290	T. Counter	
	Value 91	291	T. Age	
…				
CH40	Value 0	4000	Power Fail	D2-32-02 A.C. Current Clamp, 3 channels
	Value 1	4001	Divisor	
	Value 2	4002	Channel 1	
	Value 3	4003	Channel 2	
	Value 4	4004	Channel 3	
	…	…	…	
	Value 90	4090	T. Counter	
	Value 91	4091	T. Age	

8.2 Supported Object Types

This section describes object types that may be present in the device. Lists of optional and proprietary properties are provided for each object type. Information on range restrictions and default values of properties can be found here too. Writable properties are marked in the "W" column.

8.2.1 Device

There is one instance of the *Device* object in the gateway. It represents the gateway itself.

Property Name	Value Range	Default	W
Required			
Object_Identifier		(device, 1001)	
Object_Name	1…126 bytes	EO-BAC-IP_{*Instance_Number*}	✏ 1)
Object_Type		device	
System_Status			
Vendor_Name			
Vendor_Identifier			
Model_Name			
Firmware_Revision			
Application_Software_Version			
Protocol_Version			
Protocol_Revision			
Protocol_Services_Supported			
Protocol_Object_Types_Supported			
Object_List			
Max_APDU_Length_Accepted			
Segmentation_Supported			
APDU_Timeout	0…65535 ms	6000 ms	✏
Number_Of_APDU_Retries	0…255	3	✏
Device_Address_Binding			
Database_Revision			
Property_List			
Optional			
Location	0…126 bytes	unknown	✏ 1)
Description	0…126 bytes	Gateway EnOcean/BACnet-IP	✏ 1)
Proprietary			
LED_Indication		ENABLED	✏

1) *After entering "!default", the default text is restored.*

8.2.2 Analog Input (AI)

The number of these objects depends on the number of assigned EnOcean devices and their type.

Property Name	Value Range	Default	W
Required			
Object_Identifier			
Object_Name		see below	
Object_Type			
Present_Value			✏ 1)
Status_Flags			
Event_State			
Out_Of_Service		False	✏
Units			
Property_List			
Optional			
Description	0…126 bytes	see below	
Reliability			
Min_Pres_Value			
Max_Pres_Value			
COV_Increment	0…65535	65535 (Off)	✏ 2)
Proprietary			

1) *Present_Value writable if Out_Of_Service = true.*
2) *Value 65535 turns off the COV reporting for the object.*

AI 100–4099: Objects from this range are mapped to *RX Values* (see 8.1). AI 100–199 belongs to Channel 1, AI 200–299 to Channel 2, etc. Objects are not created for unused *Values*.

Object_Name = "RX_CH{ChNum}_V{ValueIndex}_{ValueName}"
(e.g. RX_CH1_V0_Temperature)

Description = "{ValueName} {ValueRange}" (e.g. Temperature 0…40 °C)

8.2.3 Analog Output (AO)

The number of these objects depends on the number of assigned EnOcean devices and their type.

Property Name	Value Range	Default	W
Required			
Object_Identifier			
Object_Name		see below	
Object_Type			
Present_Value			✏
Status_Flags			
Event_State			

Out_Of_Service		False	✏️
Units			
Priority_Array			
Relinquish_Default			✏️
Property_List			
Current_Command_Priority			
Optional			
Description	0…126 bytes	see below	
Min_Pres_Value			
Max_Pres_Value			
Proprietary			

AO 100100–104099: Objects from this range are mapped to *TX Values* (see 8.1). AO 100100–100199 belongs to Channel 1, AI 100200–100299 to Channel 2, etc. Objects are not created for unused *Values*.

Object_Name = "TX_CH{ChNum}_V{ValueIndex}_{ValueName}"
(e.g. TX_CH1_V0_Valve position)

Description = "{ValueName} {ValueRange}" (e.g. Valve position 0…100 %)

8.2.4 Multistate Value (MSV)

There are several MSV objects representing settings and states of the gateway and channels.

Property Name	Value Range	Default	W
Required			
Object_Identifier			
Object_Name		see below	
Object_Type			
Present_Value			✏️
Status_Flags			
Event_State			
Out_Of_Service		False	✏️
Number_Of_States			
Property_List			
Optional			
Description	0…126 bytes	see below	✏️ [1]
State_Text			
Proprietary			

1) *Writable only for Value Index 99 (MSV 199, 299, …, 4099). After entering "!default", the default text is restored.*

Ch.	Device	Object ID	Object Name	Description	W
–		MSV 1	UCOV_MODE	Broadcast mode for unsubscribed COV reporting	✏
		MSV 2	REPEATER_MODE	EnOcean repeater setting	✏
1…40	RX	MSV 199, 299, …, 4099	CH{ChNum}_CONFIG	{EEP} {Title} ({SenderID})	✏
1…40	TX	MSV 100195, 100295, …, 104095	TX_CH{ChNum}_SEND	Send option for Device{ChNum}	✏

MSV 1–2: These objects represent setting parameters of the gateway.

MSV 1 (UCOV_MODE): This parameter configures the function of Unsubscribed Change of Value (UCOV) reporting for all AI objects that have COV reporting enabled (*COV_Increment* < 65535). When turned on, the gateway sends a broadcast COV report (UnconfirmedCOVNotification message) if the condition specified by *COV_Increment* property is met.

Value	Meaning
1 – OFF (default)	Turned off
2 – LOCAL	Turned on for local network reporting (destination network number is 0)
3 – GLOBAL	Turned on for global network reporting (destination network number is 0xFFFF)

MSV 2 (REPEATER_MODE): This parameter configures the function of EnOcean repeater. If turned on, the gateway forwards received telegrams in the EnOcean network.

Value	Meaning
1 – OFF (default)	Off
2 – LEVEL1	Level 1 (only original telegrams)
3 – LEVEL2	Level 2 (original and once repeated telegrams)

MSV 199, 299, …, 4099 (CONFIG): There are 40 MSV objects (one for each channel) that indicate the state of the channel.

Value	Meaning
1 – FREE (default)	The channel is not configured, no device is assigned.
2 – ASSIGNED	The channel is configured, a device is assigned.

MSV 100195, 100295, …, 104095 (SEND): There are up to 40 of these objects (one for each channel), they are mapped to *TX Value 95*. It serves to control transmitting of data from the gateway to the device. Objects are created only for used channels.

Value	Meaning
1 – None (default)	Transmitting disabled
2 – SendNow	Transmit once immediately, the send option will not change
3 – OnReceived	Automatic response when telegram received from the assigned device (default for A5-20-01, etc.)
4…10	Reserved
11 – OnWriteV0	Transmit when Present_Value of AO 1xxx00 written
…	
25 – OnWriteV14	Transmit when Present_Value of AO 1xxx14 written
26 – OnWriteAny	Transmit when Present_Value of any AO 1xxx00…1xxx14 written

8.3 Proprietary properties

Property Name	Property ID	Datatype	Value Range	Object Type	Meaning
LED Indication	1100	Unsigned	0:DISABLED 1:ENABLED	Device	Allows to deactivate the LED indicators on the front panel

8.4 COV Notifications

The BACnet protocol allows clients to receive event notifications, e.g. when the value of an object has changed. The use of COV notifications reduces latency and network load. Regarding the EnOcean devices, a typical use case for COV is when we need to catch the button pressed events (F6-02-01, D2-03-0A, etc.).

There are several ways how to implement the COV reporting that differ in memory requirements, reliability and implementation complexity. The gateway currently supports Unsubscribed COV reporting (UCOV), which is the simplest type. It generates UnconfirmedCOVNotification messages without using COV subscriptions. These messages are addressed to all devices in the local network. This method of transferring information is called broadcasting, the broadcast IP address is used as the destination address: BroadcastIP = IPAddress OR NOT(SubnetMask); e.g. 192.168.1.90 OR NOT(255.255.255.0) = 192.168.1.255).

The COV reporting is configured by the **UCOV_MODE** global setting and the **COV_Increment** property of individual objects – see Chapters 7.2.6.and 8.2.4

If UCOV_MODE = OFF the UCOV is disabled regardless the COV_Increment settings. If UCOV_MODE = LOCAL the notifications are sent to all BACnet devices in the local network. If UCOV_MODE = GLOBAL, and there is a BACnet router in the local network, the notifications are forwarded to all available BACnet networks.

COV_Increment enables reporting for the given object. The notification is sent when the absolute difference of the Present_Value property is equal to or higher than the last reported value. For enumeration values, such as button press, the COV_Increment should always be 1.

9   FIRMWARE UPDATE

The firmware is constantly being improved and extended to support new features and devices. The latest version is available for download on FIRVENA website in the [Downloads section](). Firmware can be upgraded via gateway's web interface or via the USB port in "MSC" mode.

9.1   Over Network

The installed version number is shown in [Settings > Firmware Update].

To update firmware:

1. Download the zip file and extract the file with **.bin** extension.
2. Use *"Choose file"* or drag the **.bin** file to the dashed rectangle and use the *"Upload"* command.
3. When the upload is complete, the gateway reboots and the connection with *Web UI* is lost:
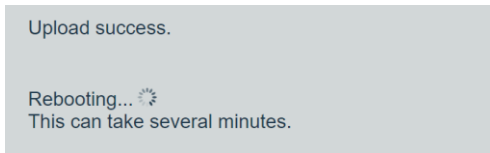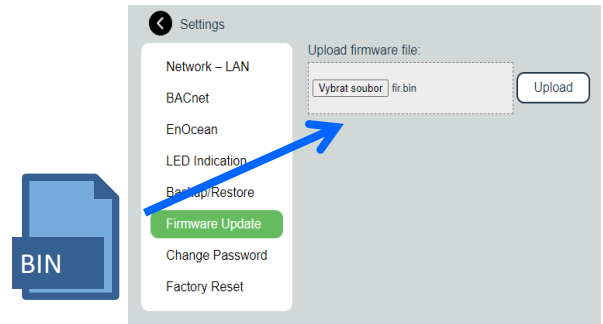
The connection should resume within several minutes.

4. Check the installed version number.

9.2   Over USB

The number of firmware version can be determined using the *EO-BAC Tool*:

To update firmware in the gateway:

- Unplug the POWER connector
- Set the left switch to the "MSC" position
- Connect the gateway to a computer using a USB cable with type B connector
- The device appears as an external disk, copy the new firmware file to the disk
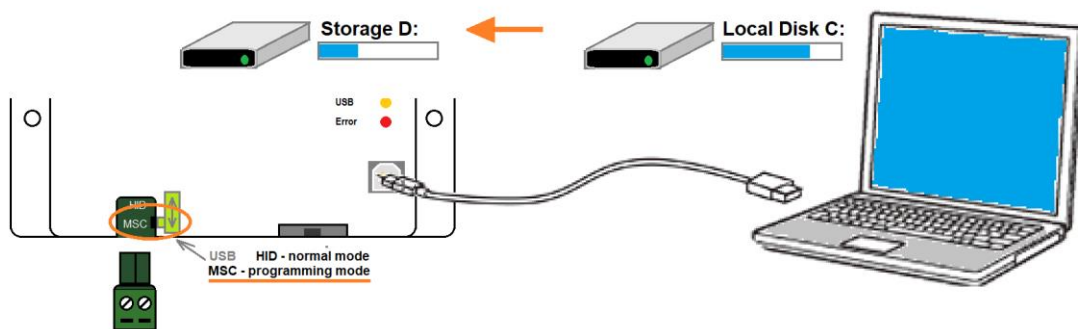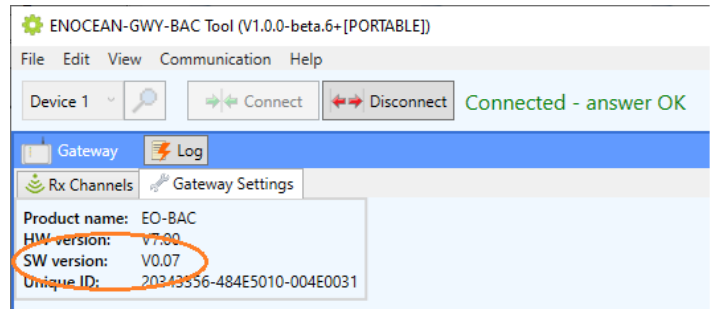
- Set the left switch back to the "HID" position, the gateway reboots
- Now, the gateway checks the file and overwrites the current firmware with the new one
- The result is indicated by LEDs
- Disconnect the USB cable and plug the POWER connector back
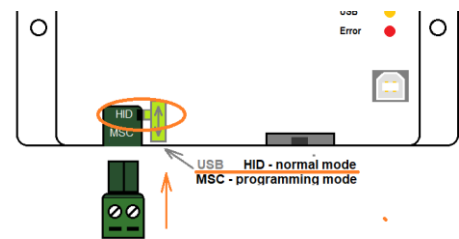
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[1]   EnOcean Technical Specifications (https://www.enocean-alliance.org/specifications/)

[2]   EnOcean Equipment Profiles (EEP) (https://www.enocean-alliance.org/wp-content/uploads/2020/07/EnOcean-Equipment-Profiles-3-1.pdf)

[3]   Communication telegrams defined in EnOcean equipment profiles (http://tools.enocean-alliance.org/EEPViewer/)

[4]   Smart Acknowledge – Bidirectional communication with energy harvesting devices (https://www.enocean-alliance.org/wp-content/uploads/2020/04/SmartAcknowledge_Specification_v1.7.pdf)

[5]   EnOcean Unique Radio Identifier – EURID Specification (https://www.enocean-alliance.org/wp-content/uploads/2021/03/EURID-v1.2.pdf)

[6]   Yabe (BACnet Explorer) (https://sourceforge.net/projects/yetanotherbacnetexplorer/)

REVISION HISTORY

Date	Version	Description
2022-04-01	V1.0	Initial release
2022-08-05	V1.1	Added bidirectional communication
2022-11-01	V1.2	Added Ch. 7.2.5 Updated figures Updated ANNEX A
2022-12-14	V1.3	Chapters rearranged Added Ch. 4, 6
2023-01-23	V1.4	Extended ANNEX A (D2-01-XX)
2023-03-24	V1.5	Updated figures Revised Ch. 7.1 (Accessing Web Interface) Added description of Edit channel view (Ch. 7.2.6) Added description of LED functions (Ch. 2) Added description of COV notifications (Ch. 8.4)
2023-05-25	V1.6	Values correction
2023-11-01	V1.7	General corrections Added Ch. 7.3.1 (Repeater description)

ANNEX A   MAPPING EXAMPLES OF ENOCEAN DEVICES

A.1   Basic Examples

MSV 199, 299, …, 4099:

Ch.	Device	Object ID	Object Name	Description	Value
1		MSV 199	CH1_CONFIG	A5-02-05 Temperature Sensors, Temperature Sensor Range 0°C to +40°C (01-81-28-68)	ASSIGNED
2		MSV 299	CH2_CONFIG	00-00-00 None (FF-FF-FF-FF)	FREE
…					
32		MSV 3299	CH32_CONFIG	D5-00-01 Contacts and Switches, Single Input Contact (01-C1-2E-70)	ASSIGNED
…					
39		MSV 3999	CH39_CONFIG	00-00-00 None (FF-FF-FF-FF)	FREE
40		MSV 4099	CH40_CONFIG	A5-09-04 CO2 Sensor (01-85-BA-3E)	ASSIGNED

AI 100–4099:

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	A5-02-05	AI 100	CH1_V0_Temperature	Temperature 0…40 °C	22.4	°C
		AI 190	CH1_V90_Telegram counter	Number of received telegrams 0…65535	12	–
		AI 191	CH1_V91_Telegram age	Time elapsed since the last telegram 0…65000 s	252	s
2	00-00-00					
…						
32	D5-00-01	AI 3200	CH32_V0_Contact	Contact 0:open, 1:closed	1	–
		AI 3290	CH32_V90_Telegram counter	Number of received telegrams 0…65535	50	–
		AI 3291	CH32_V91_Telegram age	Time elapsed since the last telegram 0…65000 s	10	s
…						
39	00-00-00					

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
40	A5-09-04	AI 4000	CH40_0_Humidity	Humidity 0…100 %	45	%
		AI 4001	CH40_1_Concentration	Concentration 0…2550 ppm	1451	ppm
		AI 4002	CH40_2_Temperature	Temperature 0…51 °C	23.2	°C
		AI 4090	CH40_V90_Telegram counter	Number of received telegrams 0…65535	2	–
		AI 4091	CH40_V91_Telegram age	Time elapsed since the last telegram 0…65000 s	33	s

A.2 RPS Buttons and Switches

The following example applies to F6-02-01, F6-02-02, F6-02-03 and F6-02-04

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	F6-02-02	AI 100	CH1_V0_BI	BI 0:released, 1:pressed	1	–
		AI 101	CH1_V1_B0	B0 0:released, 1:pressed	0	–
		AI 102	CH1_V2_AI	AI 0:released, 1:pressed	0	–
		AI 103	CH1_V3_A0	A0 0:released, 1:pressed	0	–
		AI 104	CH1_V4_Rocker B	-1:null, 0:off, 1:on	1	–
		AI 105	CH1_V4_Rocker A	-1:null, 0:off, 1:on	0	–
		AI 190	CH1_V90_Telegram counter	Number of received telegrams 0…65535	12	–
		AI 191	CH1_V91_Telegram age	Time elapsed since the last telegram 0…65000 s	1	s
2	00-00-00					
…						

V4 and V5 remember the rocker state for channel A and B, this is out of the EEP definition. Rocker B goes 1:on when BI was pressed, Rocker B goes 0:off when B0 was pressed. When no telegram has been received yet, rocker has the initial value -1:null.

A.3   A5-20-01 HVAC Components, Battery Powered Actuator

The actuator wakes up periodically, transmits the actual value and waits for a response with a new setpoint, which must be sent within 1 second. The response is built from Present_Value properties of TX data objects. The response also contains other settings, e.g. Set point type selection, Set point inverse, Summer mode, Service mode. Not all objects are listed in the table, max. number of data values is 10.

Direction RX (from actuator):

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	A5-20-01	AI 100	RX_CH1_V0_Current Value	Current Value 0...100 %	25	%
		…		Values according to the EEP spec. and visibility setting		
		AI 109				
		AI 190	RX_CH1_V90_Telegram counter	Number of received telegrams 0...65535	155	–
		AI 191	RX_CH1_V91_Telegram age	Time elapsed since the last telegram 0...65000 s	231	s
		MSV 199	CH1_CONFIG	A5-20-01 HVAC Components, Battery Powered Actuator (01-89-6C-98)	2	–
2	00-00-00					
…						

Direction TX (to actuator):

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	A5-20-01	AO 100100	TX_CH1_V0_Valve position or Temperature Setpoint	Valve position or Temperature Setpoint 0...100 %	25	%
		…		Values according to the EEP spec. and visibility setting		
		AO 100109				
		MSV 100195	TX_CH1_SEND	Send option for Device1	3 (OnReceive)	–
2	00-00-00					
…						

A.4   D2-01-XX Electronic switches and dimmers with Energy Measurement and Local Control

Device types from the D2-01-XX group share the same telegram definitions – see the profile D2-01-00 (http://tools.enocean-alliance.org/EEPViewer/profiles/D2/01/00/D2-01-00.pdf). There are several messages distinguished by the Command ID data field. Each type supports only certain commands and

functions, e.g. type 0x02 has one dimmable output, type 0x12 has two relay outputs without dimming function or type 0x0B supports energy and power measurements.

The gateway creates a universal interface for all device types from the D2-01-XX group, regardless of the features supported by a particular type.

A.4.1 Example with NodOn Micro Smart Plug (D2-01-0E) – Measurements

This actuator has one output channel and supports energy and power measurements.

Incoming data

Objects AI101…106 contains data from the status message CMD 4, objects 107…110 from the measurement message CMD 7. The object AI100 indicates which CMD was received last.

Object ID	Value Name	Range	Value	Visible	
AI 100	Command ID	4:Status Response;7…	4:Status Response	☑	
AI 101	I/O channel (STATUS)	0…31	0	☑	CMD4 – status
AI 102	Output value	0…127 %	0%	☑	
AI 103	Power Failure	0:Disabled / not supp…	0:Disabled / not supported	☑	
AI 104	Over current switch off	0:Ready / not suppor…	0:Ready / not supported	☑	
AI 105	Error level	0:Hardware OK;1:Ha…	3:Not supported	☑	
AI 106	Local control	0:Disabled / not supp…	1:Enabled	☑	
AI 107	I/O channel (MEASUREMENT)	0…31	0	☑	CMD7 – measurement
AI 108	Unit	0:Energy [Ws];1:Ener…	0:Energy [Ws]	☑	
AI 109	Measurement value (MSB)	0…65535	0	☑	
AI 110	Measurement value (LSB)	0…65535	0	☑	
AI 190	Telegram counter	0…65535	0	☑	
AI 191	Telegram age	0…65000 s	65535s	☑	

The most important is *CMD4 -> Output value*, which indicates the ON/OFF state of the actuator.

Outgoing data

It is possible to transmit different commands. The command is switched by the *Command ID* value, which is always at the first position (register 1000). The meaning of the values from register 1001 up depends on the *Command ID*. The default command is CMD1.

AO 100100	Command ID	1:Set Output;2:Set L…	1:Set Output	☑	CMD1 – set output
AO 100101	I/O channel	0…31	0	☑	
AO 100102	Output value	0…127 %	0 %	☑	
AO 100103	Dim value	0:Switch to output val…	0:Switch to output value	☑	
AO 100104	None	0…0	0	☑	
AO 100105	None	0…0	0	☑	
AO 100106	None	0…0	0	☑	
AO 100107	None	0…0	0	☑	
AO 100108	None	0…0	0	☑	
AO 100109	None	0…0	0	☑	
AO 100110	None	0…0	0	☑	
AO 100111	None	0…0	0	☑	
	Telegram counter	0…65535	0		
	Telegram age	0…65000 s	65535s		
MSV 100195	SEND	1:None;2:SendNow;3…	1:None		
MSV 199	CONFIG	1:FREE;2:ASSIGNED	2:ASSIGNED		

Apply Cancel Send Now

The most important is CMD 1, which is used to switch ON/OFF the output (0% => OFF; 100% => ON). The *Output value in percent* and *Dim value* is only applicable to devices with the dimming feature supported. The value 127% corresponds to *0x7F: Output value not valid / not applicable*.

Setting up the measurement through BACnet interface in Web UI

1. Go to Edit channel -> Values
2. Set Command ID (AO100100) to CMD 5 – Set Measurement
3. Confirm "Apply"
4. The UI gets updated:

AO 101000	Command ID	1:Set Output;2:Set L…	5:Set Measurement	✓
AO 101001	I/O channel	0…31	0	✓
AO 101002	Report measurement	0:Query only;1:Query…	0:Query only	✓
AO 101003	Reset measurement	0:False;1:True	0:False	✓
AO 101004	Measurement mode	0:Energy;1:Power	0:Energy	✓
AO 101005	Unit	0:Energy [Ws];1:Ener…	2:Energy [KWh]	✓
AO 101006	Delta to be reported (MSB)	0…4095	0	✓
AO 101007	Delta to be reported (LSB)	0…4095	0	✓
AO 101008	Max time between messages	1…2550 s	255 s	✓
AO 101009	Min time between messages	1…255 s	10 s	✓
AO 101010	None	0…0	0	✓
AO 101011	None	0…0	0	✓
	Telegram counter	0…65535	4	
	Telegram age	0…65000 s	136s	
MSV 101095	SEND	1:None;2:SendNow;3…	1:None	
MSV 1099	CONFIG	1:FREE;2:ASSIGNED	2:ASSIGNED	

CMD5 – set measurement

[Apply] [Cancel]   [Send Now]

5. Enter inputs, there are several parameters according to the EEP specification.
6. "Send Now" will transmit the telegram to the actuator.

The type D2-01-0E supports measurement report on query (CMD 6) or automatic reporting based on the configuration sent in the CMD 5.

The power and energy measurements are configured and reported separately, determined by CMD 5 -> *Measurement mode* and *Unit*; CMD 4 -> *Unit*.

The measured value is 4 byte in size, split into two 16-bit values (Measurement value = 256 * MSB + LSB), the physical unit is indicated by the *Unit* value.

A.4.2   Example with NodOn Relay Switch (D2-01-12) – Controlling the output

This actuator has two output channels, the example shows switching ON of the second channel. TX data are first prepared by writing into the TX data objects, then the control telegram (CMD1 – Set output) is sent by writing *Send option = 2:SendNow*. The actuator returns a status message (CMD4 – Status response), the message says the channel 2 (numbered from zero) is ON.

The *Send option* can also be configured so that the gateway sends when *Output value* is written (*Send option = 13:OnWriteV2*).

Dim value is not supported by this type and is ignored.

Direction TX (to actuator):

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	D2-01-12	AO 100100	TX_CH1_V0_Command ID	1:Set Output;2:Set Local; …	1	–
		AO 100101	TX_CH1_V1_I/O channel	0…31	1	–
		AO 100102	TX_CH1_V2_Output value	0…127 %	100	%
		AO 100103	TX_CH1_V3_Dim value	0:Switch to output value;1:Dim to output value – timer 1; …	0	–
		MSV 100195	TX_CH1_SEND	Send option for Device1	2 (SendNow)	–
2	00-00-00					
…						

Direction RX (from actuator):

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	D2-01-12	AI 100	RX_CH1_V0_Command ID	4:Status Response; 7:Measurement Response;	4	–
		AI 101	RX_CH1_V1_I/O channel	0…31	1	–
		AI 102	RX_CH1_V2_Output value	0…127 %	100	%
		…	Other objects			
		AI 190	RX_CH1_V90_Telegram counter	Number of received telegrams 0…65535	45	–
		AI 191	RX_CH1_V91_Telegram age	Time elapsed since the last telegram 0…65000 s	4563	s
		MSV 199	CH1_CONFIG	D2-01-12 Electronic switches and dimmers with Energy Measurement and Local Control, Type 0x12 (05-84-2C-D0)	2	–
2	00-00-00					
…						

A.5 D2-11-XX Bidirectional Room Operating Panel (Smart ACK)

What is Smart ACK?

EnOcean sensors are in sleep mode most of the time to reduce power consumption, so they cannot receive any telegram. The Smart ACK protocol enables bidirectional communication with energy self-sufficient devices. For example, Room Operating Panels D2-11-XX utilize the Smart ACK communication to receive data, which is used to show symbols on the display or override some parameters.

The Smart ACK protocol is described in [4]. When a message is sent to a Smart ACK Sensor, a device called "Post Master" stores it in a "Mailbox" until the sensor is ready to receive telegrams. When the sensor wakes up, it checks the Mailbox. The Post Master sends the message buffered in the Mailbox or Mailbox Empty message if the Mailbox is empty. The sensor receives the response from Post Master and returns to sleep mode. The Mailbox is established in Post Master during teach-in process.

The gateway does not support repeaters, there must be a direct connection between the gateway and the Smart ACK device, i.e. Post Master and Mailbox are located in the gateway.

A.5.1 Example with Thermokon SR06 LCD (D2-11-07)

Direction RX (from sensor):

The sensor sends two types of messages, ID 0 or ID 2. When Message ID is 0, only Set Point Type is valid, other values should be ignored.

Communication is initiated by the sensor on heartbeat (default 1000 s), change of measured value or button press (parameter change), which is indicated by TelegramType.

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	D2-11-07	AI 100	Set Setpoint type	0:Temperature correction;1:Temperature setpoint	1	–
		AI 101	Telegram Type	0:Heartbeat;1:Change of temperature or humidity value;2:User caused parameter	2	–
		AI 102	Message ID	0:ID-0;2:ID-2	2	–
		AI 103	Temperature	0...40 °C	23.84	°C
		AI 104	Humidity	0...100 %	0	%
		AI 105	Setpoint offset	0...255	170	–
		AI 106	Basesetpoint	15...30 °C	21	°C
		AI 107	Valid temperature correction	1:-1...1K;2:-2...2K;3:-3...3K;4:-4...4K;5:-5...5K;6:-6...6K;7:-7...7K;8:-8...8K;9:-9...9K;10:-10...10K	3	–
		AI 108	Fan speed	0:Auto;1:Speed 0;2:Speed 1;3:Speed 2;4:Speed 3;7:Not available	7	–
		AI 109	Occupancy state	0:State Unoccupied;1:State Occupied	0	–
		…				
2	00-00-00					
…						

Direction TX (to sensor):

The gateway responds with message ID 1. Settings are changed by writing these values and SendOption = 2:SendNow, changes will apply next time the sensor wakes up. Without a response, the sensor uses the last settings.

SetPointType, TemperatureCorrection, BaseSetpoint and ValidTemperatureCorrection must be mirrored from RX data if no change is required.

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	D2-11-07	AO 100100	Set Setpoint type	0:Temperature correction;1:Temperature setpoint	1	–
		AO 100101	Display heating symbol	0:Heating symbol off;1:Heating symbol on	0	–
		AO 100102	Display cooling symbol	0:Cooling symbol off;1:Cooling symbol on	0	–
		AO 100103	Display window open symbol	0:Window open symbol off;1:Window open symbol on	1	–
		AO 100104	Message ID	1:ID-1	1	–
		AO 100105	Temperature correction	0...255	128	–
		AO 100106	Basesetpoint	15...30 °C	21	°C
		AO 100107	Valid temperature correction	1:-1...1K;2:-2...2K;3:-3...3K;4:-4...4K;5:-5...5K;6:-6...6K;7:-7...7K;8:-8...8K;9:-9...9K;10:-10...10K	3	–
		AO 100108	Fan speed	0:Auto;1:Speed 0;2:Speed 1;3:Speed 2;4:Speed 3;7:Not available	0	–
		AO 100109	Occupancy state	0:State Unoccupied;1:State Occupied	0	–
		MSV 100195	TX_CH1_SEND	Send option for Device10	2 (SendNow)	–
2	00-00-00					
...						

A.6 D2-15-00 People Activity Sensor

Ch.	Device	Object ID	Object Name	Description	Present Value	Unit
1	D2-15-00	AI 100	CH1_V0_Presence	0:Present;1:Not Present;2:Not detectable;3:Presence Detector error	0	–
		AI 101	CH1_V1_Energy Storage Status	0:High;1:Medium;2:Low;3:Critical	0	–
		AI 102	CH1_V2_Pir Update Rate	1...16 s	1	s
		AI 103	CH1_V3_Pir Counter	0...65535	7568	–
		AI 104	CH1_V4_Activity	0...100 %	52	%
		AI 190	CH1_V90_Telegram counter	Number of received telegrams 0...65535	6	–
		AI 191	CH1_V91_Telegram age	Time elapsed since the last telegram 0...65000 s	11	s
		MSV 199	CH1_CONFIG	D2-15-00 People Activity Sensor (00-31-C2-2F)	2	–
2	00-00-00					
…						

The Activity is computed by gateway based on two subsequent values of the Pir Counter. When the Pir Update Rate is 1s and the sensor transmits data every 2 minutes, 100% corresponds to the Pir Counter increment of 120.

$$Activity[\%] = \frac{(PIRCounterCurrent - PIRCounterLast) \cdot PIRUpdateRate[s]}{TelegramAgeLast[s] - TelegramAgeCurrent[s]}$$

ANNEX B   BACNET PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS)

Date: March 28, 2022
Vendor Name: FIRVENA s.r.o.
Product Name: EO-BAC-IP
Product Model Number: EO-BAC-IP
Application Software Version: V1.0
Firmware Revision: V1.0
BACnet Protocol Revision: 14

Product Description:

The EO-BAC-IP device is a gateway between EnOcean and BACnet IP communication protocols. It receives data from EnOcean sensors and provides it to other devices connected to the BACnet network.

BACnet Standardized Device Profiles Supported:

BACnet Gateway (B-GW)

BACnet Interoperability Building Blocks Supported:

Data Sharing-ReadProperty-B (DS-RP-B)

Data Sharing-ReadPropertyMultiple-B (DS-RPM-B)

Data Sharing-WriteProperty-B (DS-WP-B)

Data Sharing-WritePropertyMultiple-B (DS-WPM-B)

Data Sharing-Change Of Value Unsubscribed-B (DS-COVU-B)

Device Management-Dynamic Device Binding-B (DM-DDB-B)

Device Management-Dynamic Object Binding-B (DM-DOB-B)

Device Management-DeviceCommunicationControl-B (DM-DCC-B)

Gateway-Embedded Objects-B (GW-EO-B)

Segmentation Capability: No segmentation

Standard Object Types Supported:

Refer to user manual

BACnet Data Link Layer Options: BACnet IP

Device Address Binding: No

Networking Options: None

Character Sets Supported: ISO 10646 (UTF-8)

Gateway Options:

Refer to user manual