



**EP5000ME (Modbus & EnOcean)  
EP5000VPE (0-10V & EnOcean)  
Probe Commissioning**

Ver	Date	Modification / Update
V1	04/03/2021	Initial Version
V2	20/03/2021	Occupancy by CO2 added
V3	03/02/2022	EEP update
V4	06/04/2022	New EEP
V5	14/11/2022	Thermal mode added and associated EEP

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## 1. Presentation

The EP5000ME probe or EP5000VPE (powered) and E5000AE (autonomous, light-powered) communicate by radio in EnOcean. This document presents how to commission the probe into an EnOcean ecosystem using an NFC smartphone.

For the Modbus communication or 0-10V PI control of ventilation, see respective commissioning manuals.

## 2. Security of the Memory Accessible via NFC

The NFC chip has a password to protect it in reading and writing.

The modifiable data (parameters) can only be accessed from the manufacturer application containing the passwords to avoid any hacking or corruption of data by people using standard NFC chip reading/writing software.

## 3. Download the commissioning and setting App

Parameter settings and data reading is compatible with Android smartphones (not IOS because Apple does not authorize the use of their smartphone's embedded NFC for purposes other than payment).

The "NanoSense" Application for managing the probe is available in the Android Play Store.

## 4. Smartphone type and settings

First of all, make sure your Android smartphone has NFC built-in.

Enable NFC in the settings section.

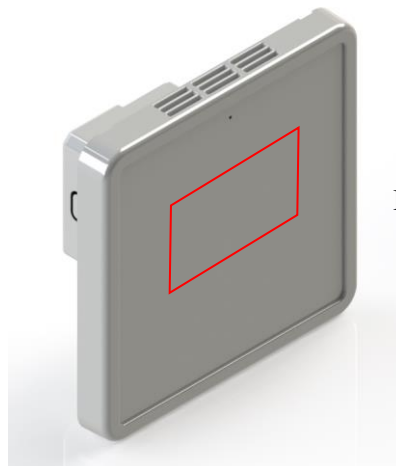
## 5. Pairings of EnOcean telegrams via the App

To pair, start the Application and approach the back of the smartphone to the center of the front of the probe (the antenna is located in the middle)

NFC reading does not require the probe to be powered. It is even possible to read the NFC memory through the lid of the box (a marking on the box may indicate the location of the NFC antenna). However, EnOcean pairing requires a radio transmission and therefore a powered probe.

When the NFC probe's antenna responds, you should hear a beep.

Go to the EnOcean pairing tab of the App (refer to the Android app manual for details.)



Emplacement de l'antenne NFC

For each telegram, the EnOcean alliance defines an EEP (EnOcean Equipment Profile) which ensures interoperability between equipment regardless of the manufacturer.

To pair, you must therefore choose the type of measurement and for some, the desired EEP. Pairing consists of sending a specific telegram with a unique ID which will be registered by the receiver (gateway, actuator...).

## 5.1. Measures and indexes

EEPs in bold are recommended or the default ones in case of automated pairing.

Details of EEPs can be viewed on the EnOcean Alliance website: <http://tools.enocean-alliance.org/EEPViewer/>

In case of similar EEP, it is always possible to differentiate them by their ID, the offset of the IDs compared to the base ID of the product is available in the Chapter “Automation of outgoing pairings.

### CO2

EEP	
A5-09-04	CO2 (2550ppm) + T° + RH
A5-09-08	Pure CO2 (2000ppm)
A5-09-09	Pure CO2 (2000ppm) with power failure
D2-04-00	CO2 (2000ppm) + T° + RH + day/night + autonomy
D2-04-01	CO2 (2000ppm) + RH + day/night + autonomy
D2-04-02	CO2 (2000ppm) + T° + day/night + autonomy
D2-04-03	CO2 (2000ppm) + T° + autonomy
D2-04-04	CO2 (2000ppm) + T°
D2-04-05	CO2 (2000ppm) + T° + day/night
D2-04-06	CO2 (2000ppm) day/night
D2-04-07	CO2 (2000ppm) + day/night + autonomy
<b>D2-04-08</b>	<b>CO2 (5000ppm) + T° + RH + day/night + autonomy</b>
D2-04-09	CO2 (5000ppm) + RH + day/night + autonomy
D2-04-10	CO2 (5000ppm) + T° + day/night + autonomy
D2-04-1A	CO2 (5000ppm) + T° + autonomy
D2-04-1B	CO2 (5000ppm) + T°
D2-04-1C	CO2 (5000ppm) + T° + day/night
D2-04-1D	CO2 (5000ppm) day/night
D2-04-1E	CO2 (5000ppm) + day/night + autonomy

### VOC

EEP	
A5-09-0C	VOC (µg/m3)

### NOx

EEP	
A5-09-0C	NOx (ppb)

### Ozone

EEP	
A5-09-0C	O3 (ppb)

### Sulfurous Odors

EEP	
A5-09-0C	Sulfurous Odors

### Particles

EEP	
A5-09-07	PM1, PM2.5, PM10

### Noise

EEP	
A5-13-11	Peak et average (dB)

### Light

EEP	
D2-14-5A	Lux & light T°
A5-07-03	Lux

### Barometric

EEP	
A5-05-01	Atmospheric Pressure (mBar)

### Indexes

EEP	
D2-60-00	Physiological effects, building health, risk of viral diffusion

### Windows Syntheses

EEP	
D5-00-01	Windows contact status

### Modes

EEP	
D2-60-03	Current Mode and exemptions

For MME version only:

### VAV and dampers data (Air flow, Opening)

EEP	
D2-60-02	For each controlled VAV or damper (8max)

## 5.2. Control commands

### Ventilation (dilution)

EEP	Type	Comment
F6-02-01	ON/Off	
<b>A5-3F-7F</b>	<b>Generic</b>	<b>Byte1, 0-100%</b>
D2-05-00	Natural ventilation	0-99%, 100% locked

### Recycling

EEP	Type	Comment
F6-02-01	ON/Off	
<b>A5-3F-7F</b>	<b>Generic</b>	<b>Byte1, 0-100%</b>

### Heating (7 bidirectional valves allowed with identical EEP)

EEP	Type	Comment
F6-02-01	ON/Off	
A5-3F-7F	Generic	Byte1, 0-100% (similar to A5-20-03)
<b>A5-20-01</b>	<b>Valve (bi dir.)</b>	
A5-20-02	Valve (bi dir.)	Not Implemented yet
A5-20-03	Valve (bi dir.)	Powered, Broadcast

### Air conditioning (only one bidirectional actuator allowed)

EEP	Type	Comment
F6-02-01	ON/Off	
A5-3F-7F	Generic	Byte1, 0-100% (similar to A5-20-03)
<b>A5-20-01</b>	<b>Valve (bi dir.)</b>	
A5-20-02	Valve (bi dir.)	Not Implemented yet
A5-20-03	Valve (bi dir.)	Powered, Broadcast

### Free cooling (Heat exchanger bypass)

EEP	Type	Comment
F6-02-01	ON/Off	Transmitted by the sensor or received from HVAC according to settings

## 5.3. Ecosystem

Since the QAI probe is powered, it can constantly listen the EnOcean ecosystem. Occupancy sensors thus make it possible to automatically switch from Comfort mode to Eco mode. The night sensor allows to switch to Night mode. Each mode has different setpoints for energy saving.

The outdoor air quality information is used to manage the window opening indication pictograms. There are two pictograms, in case the room overlooks two facades equipped with separate outdoor air quality probes (street, backyard). It is therefore possible to pair two outdoor probes.

Window opening sensors allow, in the event of opening, to cut off heating, air conditioning and ventilation. When one of the paired windows is open, the street or backyard side opening indicator flashes (future function).

### 5.3.1. OAQ probe

Two (one per façade) OAQ (Outdoor Air Quality) probes can be used to manage the light indicators on the front panel indicating whether or not the outdoor air is better than the indoor air, thus allowing the windows to be opened in fully aware of the facts.

#### Outdoor Temperature and humidity

EEP	Type
A5-04-03	Temperature Sensor Range -20°C to +60°C; HR 0-100%

#### Outdoor Particles

EEP	Type
A5-09-07	PM

#### Outdoor Noise

EEP	Type
A5-13-11	Average an peak noise

#### Outdoor NOx

EEP	Type
A5-09-05	NOx (available soon)

#### Outdoor Ozone

EEP	Type
A5-09-05	O3

### 5.3.2. BMS

The Building Management System can force modes, in particular to anticipate heating according to the outdoor temperature and the temperature rise time.

The BMS can also change the IAQ and temperature setpoints.

#### Temperature setpoints

EEP	Type
D2-00-02	Temperatures setpoint for each mode

#### Modes and exemptions

EEP	Type
D2-60-03	Mode override and exemptions

#### IAQ setpoints

EEP	Type
D2-60-01	IAQ setpoints

#### Physio indexes setpoints

EEP	Type
D2-60-00	Physio indexes / setpoints

### Switch physio / measures

EEP	Comment
F6-02-01	Switch Physio / Measures

### 5.3.3. Sensors Mode

There are 3 operating modes with specific setpoints for each one.

- Comfort corresponds to the occupation of the premises
- Eco corresponds to an unoccupied building or room.
- Night

Ecosystem Sensors allow to switch from one mode to another.

#### Occupancy (only one sensor allowed)

EEP	Type
F6-04-01	Key card activated switch
F6-04-02	Key card activated switch ERP2
<b>A5-07-01</b>	<b>Occupancy with supply voltage monitor</b>
A5-07-02	Occupancy with supply voltage monitor
A5-08-01	Occupancy with light & T°
A5-08-02	Occupancy with light & T°
A5-08-03	Occupancy with light & T°

Presence suspicion on exhaled CO2 can also be used thanks to the embedded CO2 sensor.

#### Night (only one sensor allowed)

EEP	Type	Comment
<b>A5-06-02</b>	<b>light sensor (0 to 1020 Lux)</b>	Night is interpreted according to Lux threshold setting
A5-06-03	light sensor (0 to 1000 Lux)	
A5-08-01	Occupancy with light (0 to 510 lux) & T°	
A5-08-02	Occupancy with light (0 to 1020 lux) & T°	
A5-08-03	Occupancy with light (0 to 1530 lux) & T°	

Embedded light sensor can be used too.

### 5.3.4. Windows

If at least one window is opened during one minute, the probe switches off ventilation, heating and air conditioning.

#### Windows opening (8 allowed)

EEP	Type
D5-00-01	Window contact switch



## 6. Emission rate

The emission rate depends on the number of transmitted telegrams.  
There is a 5 seconds silence between each transmission.

Assuming that the following EEPs are transmitted:

1	CO2 T°, RH
2	COV
3	PM
4	Noise
5	Light
6	ventilation Control
7	Physio Indexes

Total 7 x 5 seconds = cycle of 35 seconds

However, the rate can be set by NFC for a longer period.

## 7. EnOcean unpairing

IDs of the telegrams sent by the probe are saved in the receivers (actuator, gateway...). It is therefore appropriate to unpair them from the receiver side. Telegrams will continue to be sent by the probe. The IDs of the bidirectional actuators on battery or in energy harvesting are saved in the probe. The IDs of occupancy, night or window opening sensors are also saved in the sensor. Only IDs stored in the probe can be unpaired. To unpair, use the smartphone App.

## 8. Automation of outgoing pairings

The smartphone application allows to send a whole series of measurements pairing telegrams. However, as the IDs of the different EEPs are calculated from the base ID There is a way via the smartphone to release all the measurement pairing telegrams. It is possible for a gateway that masters the principle of this automation, to pair only the CO2 then to calculate the following IDs according to the following table:

	Base ID EnOcean
CO2 T°, RH	+1
VOCT	+2
PM	+3
Noise	+4
Lux & Light T°	+5
Reserved	+6
Atmospheric Pressure	+7
Reserved	+8
NOx	+9
Ozone	+10
Formaldehyde (Growth potential)	+11
Benzene (Growth potential)	+12

Presumption of occupancy (on CO2)	+13
Ventilation Control	+14
Recycling Control	+15
Heating Control	+16
Cooling Control	+17
ON/OFF free cooling heat exchanger bypass	+18
Physio effects (Indexes)	+19
Reserved	+20
Reserved	+21
Reserved	+22
Modes and exemptions	+23
Windows	+24
VAV 1 and valve status, MM only	+25
VAV 2 and valve status, MM only	+26
VAV 3 and valve status, MM only	+27
VAV 4 and valve status, MM only	+28
VAV 5 and valve status, MM only	+29
VAV 6 and valve status, MM only	+30
VAV 7 and valve status, MM only	+31
VAV 8 and valve status, MM only	+32

EEPs used are in this case the default ones (indicated in bold in the previous chapter) but also depend, for the actuators, on the prior Continuous or On Off setting in the **General** tab of the App.

## 9. Annex

EEP VOC details

<b>RORG</b>	<b>A5</b>	<b>4BS Telegram</b>
<b>FUNC</b>	<b>09</b>	<b>Gas Sensor</b>
<b>TYPE</b>	<b>0C</b>	<b>VOC Sensor</b>

Offset	Size	Bitrange	Data	ShortCut	Description	Valid Range	Scale	Unit
0	16	DB3.7...DB2.0	VOC	Conc	VOC concentration	0 .. 65535	0 .. 65535	ppb
16	8	DB1.7...DB1.0	VOC ID*	VOC ID	VOC identification	0..255	See annex 1	
24	4	DB0.7...DB0.4						
28	1	DB0.3	LRN bit	LRNB	LRN Bit	Enum: 0 : Teach-in telegram 1 : Data telegram		
29	1	DB0.2	Unit	Unit	Unit of VOC concentration	Enum: 0: ppb 1: $\mu\text{g}/\text{m}^3$		
30	2	DB0.1 ... DB0.0	Scale Multiplier	SCM	Scale Multiplier	Enum: 0: 0.01 1: <b>0.1</b> 2: 1 3: 10		

Annex 1 list of VOC

ID number	VOC ID
0	VOCT (total)
1	Formaldehyde
2	Benzene
3	Styrene
4	Toluene
5	Tetrachloroethylene
6	Xylene
7	n-Hexane
8	n-Octane
9	Cyclopentane
10	Methanol
11	Ethanol
12	1-Pentanol
13	Acetone
14	ethylene Oxide
15	Acetaldehyde ue
16	Acetic Acid
17	Propionice Acid
18	Valeric Acid
19	Butyric Acid
20	Ammoniac
22	Hydrogen Sulfide
23	Dimethylsulfide
24	2-Butanol (butyl Alcohol)
25	2-Methylpropanol
26	Diethyl ether
.....	.....
.....	.....
255	ozone

This official list is completed by NOx in 254 and sulfurous odors in 253