



E4000-NG air quality probe RS485 setting

The E4000-NG probe is an improved version (New Generation) of the E4000 probe.

Ver	Date	Modification / Update
V1	Initial	Initial version
V2	11 Oct. 2012	Choice between ASCII & RTU
V3	09 Dec 2013	Ventilation thresholds setting
V4	06 June 2018	NG version with new features

Summary

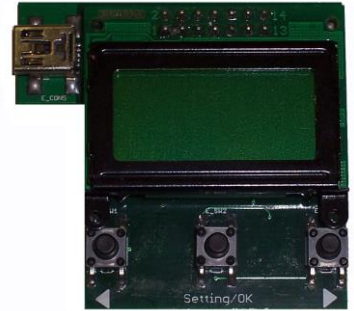
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1. Modbus

The E4000 motherboard has an embedded RS485 Modbus port. When there is no daughter board (wired or wireless EnOcean Bus) this port is configured as a slave and can be queried to provide ventilation, cooling and heating controls as well as measures. Refer to the E4000 Modbus document for details on the protocol.

2. Setting Tool

The probe E4000 is using an LCD configuration tool that allows setting the probe. This LCD fits on the motherboard. It is not necessary to shut down the probe to plug the tool.



Control buttons

- The left and right buttons allow navigation in the menus.
- The middle button allows validating the menu.

3. Procedure

- 1) Insert the LCD, the screen displays the first line in black.
- 2) Start the learning mode by pressing Setting (Middle button).
- 3) The display shows the serial number of the probe for 3 seconds and then displays:

>	R	S	4	8	5		
	E	N	O	C	E	A	N
	S	E	T	T	I	N	G
	E	X	I	T			

The third blank line is not visible but is still accessible via the navigation buttons.

4. RS485 Address

- 4.1) Select "RS485" with the navigation buttons and press OK (Middle button). The screen displays the following choices.

>	A	D	D	:	1	4	
	R	E	T	U	R	N	

Please note that the default address is linked to the serial number. So there is one chance for 255 to have the same address in the same manufacturing batch.

- 4.2) Select "ADD" (address) with the navigation buttons and press OK (Middle button).

The screen displays the following choices.

	A	D	D	:	2	5	5
<	-		O	K		-	>

Please note that the maximum address is 255. Beyond, it goes back to 1.

4.3) Press + or - to select the desired address and press OK (Middle button) to confirm
The screen displays the following choices.

>	S	A	V	E			
	C	A	N	C	E	L	

Select "**SAVE**" to save the selected address or "**CANCEL**" to cancel.

4.4) If you have saved, the screen displays the following message.

>	S	A	V	E	D		

To return to the main menu press OK

5. RS485 Protocol

5.1) Select "**RTU**" (default protocol) with the navigation buttons and press OK (Middle button) to switch to **ASCII** mode and vice versa.
The screen indicates the choice made.

	A	D	D	:	1	4	
>	R	T	U				
	R	E	T	U	R	N	

	A	D	D	:	1	4	
>	A	S	C	I	I		
	R	E	T	U	R	N	

5.2 Select "**RETURN**" with the navigation buttons and press OK (Middle button) to comeback in the main menu.

	A	D	D	:	1	4	
	A	S	C	I	I		
>	R	E	T	U	R	N	

BE CAREFUL

YOU WILL HAVE TO LEAVE VIA THE EXIT FUNCTION IF YOU WANT TO RECORD THE CHANGE.

6. Temperature Setpoint

The E4000 probe can be used as temperature sensor and control heating and cooling according to set points.

The temperature control by the E4000 probe benefits from its self-adaptive PID function.

Derogation buy the Modbus of those setpoints is permitted and will change the values set by with LCD tool.

A configuration without a Room operating panel is more suitable for facilities where the operator does not want occupants to act on the temperature setting.

The heater default setting is 20°C (18°C for ECO mode) and 30°C (33°C for ECO mode) for air conditioning but it is possible to change this setting as follows.

	R	S	4	8	5		
	E	N	O	C	E	A	N
>	S	E	T	T	I	N	G
	E	X	I	T			

6.1) From the main menu, select "SETTING" and press OK (Middle button).

The screen displays the following choices:

	S	T	E	P	S		
>	T	E	M	P			
	R	E	P	E	A	T	
	R	E	T	U	R	N	

6.2) Then select "TEMP" and press OK (Middle button).(STEPS and REPEAT are not available in RS485)

The screen displays the following choices:

>	H	E	A	T	I	N	G
	C	O	O	L	I	N	G
	R	E	T	U	R	N	

6.3) Select "HEATING" or "COOLING" to determine the temperature of heating or cooling set point and press OK (Middle button).

The screen displays the following choices:

>	C	O	N	F	O	R	T
	E	C	O	N	O	M	Y
	R	E	T	U	R	N	

6.4) Select "CONFORT" or "ECONOMY" and press OK (Middle button).

The screen displays the following choices:

	2	0	.	0	°	C	
	6	8	.	0	°	F	
	R	E	T	U	R	N	

6.5) Select °C or °F, press OK (Middle button) and adjust the temperature with + and - and then confirm by pressing (Middle button).

	2	0	.	1	°	C	
<	-	-	O	K	-	-	>

The economic mode value temperature set point is limited to the one of the comfort mode. Therefore the comfort temperature must be set first.

Beware the temperature setting is limited to 5 ° C between heating and cooling (comfort zone). If it becomes impossible to increase the heating temperature set point, come back to the cooling set point and increase the value.

Please note that the choice of parameters in ECO mode is not available in RS485 slave mode (without EnOcean, LON or KNX board) (see next page).

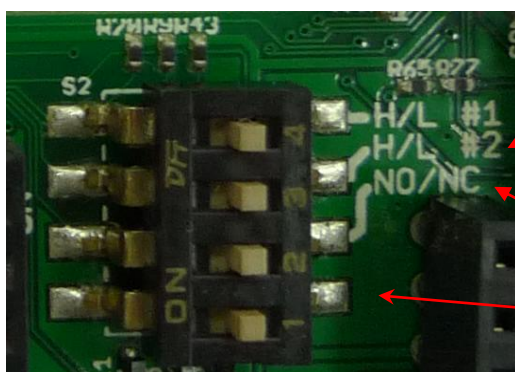
6.6) Comeback in the main menu.

	R	S	4	8	5		
>	E	N	O	C	E	A	N
	S	E	T	T	I	N	G
	E	X	I	T			

7. Ventilation thresholds setting

Modbus commands operate based on CO2, VOCs and RH parameterized thresholds by 4 micro switches:

Two dry contacts of analog board (speed 1 and 2) or RS485 & EnOcean commands operate based on CO2, VOCs and RH parameterized thresholds by micro switches:



Dry contact # 1 thresholds: CO2: 700 ppm or 1200 (selectable H = High / L = Low) during more than 10 minutes or RH threshold (default 75%) over 2 minutes.

Dry contact #2 thresholds: CO2: 1500 or 2000ppm (selectable H = High / L = Low) during more than 2 minutes or RH threshold + 5% over 60 seconds.

Logic of dry contact NO, Normally Open, Normally Closed.

VOC thresholds for regular building or sustainable building like BREEAM or LEED:

Dry contact #1: 300 or 1000 µg/m3 more than 10 minutes

Dry contact #2 :1000 or 3000 µg/m3 more than 2 minutes

No marking but similar to others:

H = Haut (High) / L = Bas (Low)

Modbus return the status of the last three micro-switches and dry contacts of a virtual or real analog board based on threshold settings. Hysteresis of contacts: CO2: 100ppm, VOC: 10% of the formaldehyde threshold equivalent, HR: 10% of the threshold.

A continuously Modbus command is also matching the 0-10V output of a virtual or actual analog board.

In both cases see <http://www.nano-sense.com/Docs/UK/E4000/E4000-NG-Analog-option.pdf>

Continuous command corresponds to a mix of CO2, VOC and humidity (with an OR function: the most significant prevailing over others). Only the switch # 1 has an action on the control of continuous ventilation. Minimum ventilation of 10% is always provides for building hygiene.

8. RH (humidity) threshold settings

It is possible to set the humidity threshold as follows:

The adjustable threshold corresponds to the dry contact # 1 threshold of the previous chapter. Dry contact # 2 threshold is deduced from this threshold by adding 5% RH.

By default the threshold is set to 75% RH.

	R	S	4	8	5		
	E	N	O	C	E	A	N
>	S	E	T	T	I	N	G
	E	X	I	T			

In the main menu, select "**SETTING**" and press OK (Middle button).

The screen displays the following choices:

	S	T	E	P	S		
	T	E	M	P			
>	H	U	M				
	V	O	C				
	R	E	P	E	A	T	
	R	E	T	U	R	N	

Then select "**HUM**" and press OK (Middle button).

The screen displays the following choices:

			7	7	%		
<	-		O	K		-	>

Set the desired threshold by pressing more or less then confirm with OK (Middle button).

Select "**SAVE**" and press OK (Middle button) to save the setting

>	S	A	V	E			
	C	A	N	C	E	L	

Press OK (Middle button) and the following confirmation message is then displayed.

S	A	V	E	D			

9. Type of VOC measure settings

The measurement of VOC for ventilation control requires an auto-zero based on the healthiest air seen in the context of ventilation or aeration. Indeed, the outdoor air is never ideal and it would be futile to want to reach a level of VOC lower than that of the fresh air, at the risk of over ventilating unnecessarily. The absolute measurement of VOC uses the zero factory. This zero is obtained after hours of fresh air cleaning. In this configuration, there is no auto zero. Factory zero drift cannot be fully guaranteed for years and will depend mainly on possible sensor contaminations.

By default, the VOC measurement is in relative measurement mode. It is possible to choose between absolute VOC measurement and relative VOC measurement as follows:

	R	S	4	8	5		
	E	N	O	C	E	A	N
>	S	E	T	T	I	N	G
	E	X	I	T			

In the main menu, select "**SETTING**" and press OK (Middle button). The screen displays the following choices:

	S	T	E	P	S		
	T	E	M	P			
	H	U	M				
>	V	O	C				
	R	E	P	E	A	T	
	R	E	T	U	R	N	

Then select "**VOC**" and press OK (Middle button).

The display shows the current mode:

	V	O	C				
>	R	E	L				

To choose another mode press OK (Middle button)

The display shows the possible modes:

	A	B	S				
>	R	E	L				

Select the mode by moving the indicator with the right or left key then press OK (Middle button).

Select "**SAVE**" and press OK (Middle button) to save the setting.

>	S	A	V	E			
	C	A	N	C	E	L	

Press OK (Middle button) and the following confirmation message is then displayed.

S	A	V	E	D			

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