

QUICK GUIDE

EE850 - CO₂, Humidity and Temperature Duct Sensor with RS485 Interface

(Full User's Guide at www.epluse.com/EE850)

Hardware

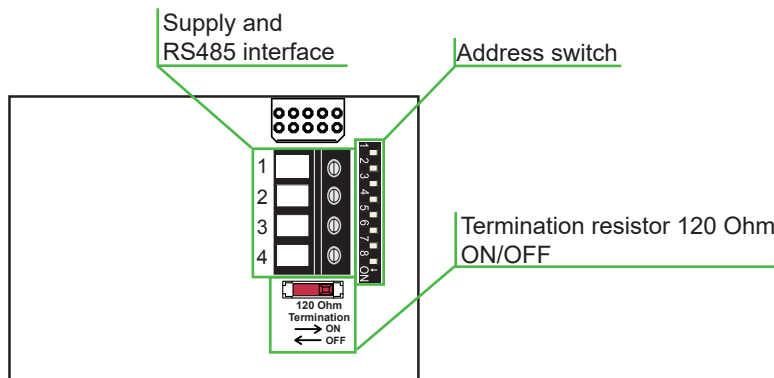
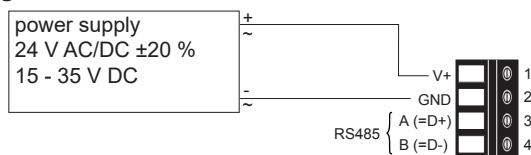
The bus termination shall be realized with 120 Ohm resistor (slide switch on the board).

Very important:

For proper function the power supply must be strong enough to ensure supply voltage within the specified range (see technical data) at any time and at all devices in the bus. This is particularly relevant when using long and thin cables which can cause high voltage drop. Please note that a single EE850 requires peak current of 350 mA.

Wiring

Digital interface



Address Setting

Address Switch



Address setting via EE-PCS Product Configuration Software:

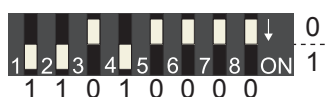
All Dip-Switches at position 0 → address has to be set via Product Configuration Software

Modbus (Slave device): factory setting EE850: 67 (permitted values: 1...247).

BACnet (Master device): factory setting EE850: 67 (permitted values: 0...127).

Example: Slave address is set via configuration software.

Address Switch



Address setting via Dip-Switch:

Modbus (Slave device): Setting the Dip-Switch to any other address than 0, overrules the slave address set via configuration software (permitted values: 1...247).

BACnet (Master device): Setting the Dip-Switch to any other address than 0, overrules the slave address set via configuration software.

BACnet Note: permitted values are 0...127. The 8th bit of the Dip-Switch is ignored (ID 127 = 0111 111).

To set address 0 via Dip-Switch, the 8th bit shall be set to 1 (ID 0 = 1000 0000).

Example: Slave address set to 11 (= 0000 1011 binary).

BACnet Setup

Please see PICS (Product Implementation Conformance Statement) - available on www.epluse.com/EE850

Modbus Setup

The measured values are saved as a 32 bit float value and 16 bit signed integer.

The EE850 factory setting for the slave-ID (Modbus address) is 67 as an integer 16 bit value.

This ID can be changed by the user in the register 60001 (0x00), permitted values are 1...247.

The serial number as ASCII-code is located at read register address 30001-30008 (16 bit per address).

The firmware version is located at register address 30009 (bit 15...8 = major release; bit 7...0 = minor release).

FLOAT (read register):

Function code / Register number ¹⁾ [Dec]	Register address ²⁾ [HEX]	Parameter name	
31003	0x3EA	Temperature	[°C]
31005	0x3EC	Temperature	[°F]
31021	0x3FC	Relative Humidity	[%]
31061	0x424	CO ₂ average	[ppm]
31063	0x426	CO ₂ RAW	[ppm]
31101	0x44C	Water vapour partial pressure	[mbar]
31103	0x44E	Water vapour partial pressure	[psi]
31105	0x450	Dew point temperature	[°C]
31107	0x452	Dew point temperature	[°F]
31113	0x458	Absolute humidity	[g/m ³]
31115	0x45A	Absolute humidity	[gr/ft ³]
31121	0x460	Mixing ratio	[g/kg]
31123	0x462	Mixing ratio	[gr/lb]
31125	0x464	Specific enthalpy	[kJ/kg]
31127	0x466	Specific enthalpy	[ft lbf/lb]
31129	0x468	Specific enthalpy	[BTU/lb]
31131	0x46A	Frost point temperature	[°C]
31133	0x46C	Frost point temperature	[°F]

- 1) Register number starts from 1
 2) Register address starts from 0

INTEGER (read register):

Function code / Register number ¹⁾ [Dec]	Register address ²⁾ [HEX]	Parameter name	
34002	0xFA1	Temperature	[°C] * 100
34003	0xFA2	Temperature	[°F] * 50
34011	0xFAA	Relative Humidity	[%] * 100
34031	0xFBE	CO ₂ average	[ppm] * 1
34032	0xFBF	CO ₂ RAW	[ppm] * 1
34051	0xFD2	Water vapour partial pressure	[mbar] * 10
34052	0xFD3	Water vapour partial pressure	[psi] * 1000
34053	0xFD4	Dew point temperature	[°C] * 100
34054	0xFD5	Dew point temperature	[°F] * 100
34057	0xFD8	Absolute humidity	[g/m ³] * 10
34058	0xFD9	Absolute humidity	[gr/ft ³] * 10
34061	0xFDC	Mixing ratio	[g/kg] * 10
34062	0xFDD	Mixing ratio	[gr/lb] * 10
34063	0xFDE	Specific enthalpy	[kJ/kg] * 1
34064	0xFDF	Specific enthalpy	[ft lbf/lb] * 1
34065	0xFE0	Specific enthalpy	[BTU/lb] * 1
34066	0xFE1	Frost point temperature	[°C] * 100
34067	0xFE2	Frost point temperature	[°F] * 100

- *xxx is the factory scaling of stored value
 *100 is the scale 1:100 (e.g. 2550 is equivalent to 25.5 °C)
 *50 is the scale 1:50 (e.g.: 2550 is equivalent to 51 °F)
 *10 is the scale 1:10 (e.g.: 135 is equivalent to 13.5 mbar)
 *1 is the scale 1:1 (e.g.: 800 is equivalent to 800 ppm)

INTEGER (write register):

Function code / Register number ¹⁾ [Dec]	Register address ²⁾ [HEX]	Parameter name
60001	0x00	Slave-ID (modbus address)*
60002	0x01	Modbus protocol settings**

- * If the ID is set via DIP-Switch the response will be NAK.
 ** For Modbus protocol setting please see Application Note Modbus AN0103 at www.epluse.com

INFO (read register):

Function code / Register number ¹⁾ [Dec]	Register address ²⁾ [HEX]	Parameter name
30001	0x00	Serial number (as ASCII)
30009	0x08	Firmware version

Modbus RTU Example

Example of MODBUS RTU command for reading the CO₂ (float value) CO₂ = 1288,34375 ppm from the register 0x424

Device EE850; slave ID 67 [43 in HEX]

Reference document, chapter 6.3: http://www.modbus.org/docs/Modbus_Application_Protocol_V1_1b.pdf

Request [Hex]: 43 03 04 24 00 02 8A 12

	Modbus ID address	Function code	Starting address Hi	Starting address Lo	No. of register Hi	No. of register Lo	CRC	
Request [Hex]:	43	03	04	24	00	02	8A	12

Response [Hex]: 43 03 04 0B 00 44 A1 68 AB

	Modbus ID address	Function code	Byte count	Register 1 value Hi	Register 1 value Lo	Register 2 value Hi	Register 2 value Lo	CRC	
Response [Hex]:	43	03	04	0B	00	44	A1	68	AB

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